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1995 Annual Status Report

*A Summary of Fish Data in Six Reaches of the
Upper Mississippi River System*



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1995 Annual Status Report

A Summary of Fish Data in Six Reaches of the Upper Mississippi River System

by

Steve Gutreuter¹ and Randy W. Burkhardt
U.S. Geological Survey
Environmental Management Technical Center
575 Lester Avenue
Onalaska, Wisconsin 54650

Mark Stopyro
Minnesota Department of Natural Resources
1801 S. Oak Street
Lake City, Minnesota 55041

Andrew Bartels and Eric Kramer
Wisconsin Department of Natural Resources
Onalaska Field Station
575 Lester Avenue
Onalaska, Wisconsin 54650

Melvin C. Bowler
Iowa Department of Natural Resources
Mississippi River Monitoring Station
206 Rose Street
Bellevue, Iowa 52031

Frederick A. Cronin and Dirk W. Soergel
Illinois Natural History Survey
Alton Field Station
4134 Alby Street
Alton, Illinois 62002

Michael D. Petersen and David P. Herzog
Missouri Department of Conservation
3815 E. Jackson Boulevard
Jackson, Missouri 63755

Kevin S. Irons, Timothy M. O'Hara, K. Douglas Blodgett, and Paul T. Raibley
Illinois Natural History Survey
Havana Field Station
704 N. Schrader Avenue
Havana, Illinois 62644

August 1997

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¹Present address: U.S. Geological Survey, Upper Mississippi Science Center, 2630 Fanta Reed Road, La Crosse, Wisconsin 54603.

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Preface

This report is a product of the Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System. The LTRMP was authorized under the Water Resources Development Act of 1986 (Public Law 99-662) as an element of the U.S. Army Corps of Engineers' Environmental Management Program. The LTRMP is being implemented by the Environmental Management Technical Center, a U.S. Geological Survey science center, in cooperation with the five Upper Mississippi River System (UMRS) States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The U.S. Army Corps of Engineers provides guidance and has overall Program responsibility. The mode of operation and respective roles of the agencies are outlined in a 1988 Memorandum of Agreement.

The UMRS encompasses the commercially navigable reaches of the Upper Mississippi River, as well as the Illinois River and navigable portions of the Kaskaskia, Black, St. Croix, and Minnesota Rivers. Congress has declared the UMRS to be both a nationally significant ecosystem and a nationally significant commercial navigation system. The mission of the LTRMP is to provide decision makers with information for maintaining the UMRS as a sustainable large river ecosystem given its multiple-use character. The long-term goals of the Program are to understand the system, determine resource trends and effects, develop management alternatives, manage information, and develop useful products.

Data (factual record) and information (usable interpretation of data) are the primary products of the LTRMP. Data on water quality, vegetation, aquatic macroinvertebrates, and fish are collected using a network of six field stations on the Upper Mississippi and Illinois Rivers. Analysis, interpretation, and the reporting of information are conducted at the six field stations and at the Environmental Management Technical Center, the operational center of the LTRMP. Informational products of the LTRMP include professional presentations, reports, and publications in the open and peer-reviewed scientific literature.

This document is an annual status report for 1995, containing a synthesis of data from fish populations and communities in the Upper Mississippi River System. This report satisfies, for 1995, Task 2.2.8.4, *Evaluate and Summarize Annual Results* under Goal 2, *Monitor and Evaluate the Condition of the Upper Mississippi River Ecosystem* as specified in the Operating Plan for the Long Term Resource Monitoring Program (USFWS 1993). This report was developed with funding provided by the Long Term Resource Monitoring Program. The purposes of this annual synthesis report are to provide (1) a systemwide summary of data in standardized tables and figures, and (2) initial identification and interpretation of observed spatial and temporal patterns. The primary data summarized in this report are available from the Environmental Management Technical Center.

1995 Annual Status Report

A Summary of Fish Data in Six Reaches of the Upper Mississippi River System

by

Steve Gutreuter, Randy W. Burkhardt, Mark Stopyro, Andrew Bartels,
Eric Kramer, Melvin C. Bowler, Frederick A. Cronin, Dirk W. Soergel,
Michael D. Petersen, David P. Herzog, Kevin S. Irons, Timothy M. O'Hara,
K. Douglas Blodgett, and Paul T. Raibley

Abstract

The Long Term Resource Monitoring Program (LTRMP) completed 2,723 collections of fishes from stratified random and permanently fixed sampling locations in six study reaches of the Upper Mississippi River System during 1995. Collection methods included day and night electrofishing, hoop netting, fyke netting (two net sizes), gill netting, seining, and trawling in select aquatic area classes. The six LTRMP study reaches are Pools 4 (excluding Lake Pepin), 8, 13, and 26 of the Upper Mississippi River, an unimpounded reach of the Mississippi River near Cape Girardeau, Missouri, and the La Grange Pool of the Illinois River. A total of 59–72 fish species were detected in each study reach. For each of the six LTRMP study reaches, this report contains summaries of: (1) sampling efforts in each combination of gear type and aquatic area class, (2) total catches of each species from each gear type, (3) mean catch-per-unit of gear effort statistics and standard errors for common species from each combination of aquatic area class and selected gear type, and (4) length distributions of common species from selected gear types.

Introduction

The objective of this report is to summarize key features of fish populations and communities from samples collected by field stations of the Long Term Resource Monitoring Program (LTRMP) from the Upper Mississippi River System (UMRS). The fisheries component of the LTRMP is charged, in part, with monitoring and reporting trends in the status of selected fish populations and fish communities of the UMRS (USFWS 1993). Intended as a data summary, this report contains only minimal descriptive syntheses. The LTRMP is required to produce trend reports at 5-year intervals that contain quantitative analyses and systemic syntheses of temporal changes. Further, the LTRMP uses these monitoring data in analyses to address specific issues of concern to LTRMP partners; these analyses are reported in special reports and in the open scientific literature.

Fish are the primary biotic object of recreational and commercial use on the UMRS. During 1982, UMRS fisheries provided more than 8.5 million activity days of sportfishing that generated more than \$150 million in direct expenditures (Fremling et al. 1989). Commercial fisheries of the UMRS were valued at more than \$2.4 million in 1987 (UMRCC 1989). Adverse trends in fisheries of the UMRS would have detrimental effects on recreation and the regional economy. Therefore, it is important to detect any adverse trends as they occur so that remedial actions can be considered.

Monitoring of and research on fish are also important because fish often affect other ecosystem elements. Although documentation of the effects of fish on other biota is derived primarily from lakes and reservoirs (Northcote 1988), and traditional thought maintains that the dynamics of river biota are influenced primarily by abiotic factors, recent evidence shows that the dynamics of fish assemblages in temperate rivers are regulated in part by biotic factors (Welcomme et al. 1989). Fish may exert influences on other biota in riverine ecosystems and may, therefore, be of broad ecological importance. For example, evidence shows that common carp (*Cyprinus carpio*), an abundant species in the UMRS, may depress or even eliminate macrophytes either through uprooting or disturbance of substrate (Cahn 1929; Macrae 1979). Effects of fish on benthic

macroinvertebrates are well known (Northcote 1988). Therefore, trends in abundance of fish may be crucial in explaining trends in abundance of other riverine biota.

Resource monitoring is an important component of long-term ecological research on processes governing large-scale ecosystems. It is nearly impossible to perform experimental manipulations of the UMRS on large spatial scales and to incorporate replication. Long-term data from standardized sampling programs that span natural or anthropogenic disturbances are the only means for gaining an understanding of large-scale processes governing large river systems (Sparks et al. 1990). Further, the LTRMP fisheries component will provide support for the formulation and investigation of research hypotheses concerning smaller scales using focused experimentation. Therefore, the combination of routine monitoring coupled with more intensive investigation of consequences of disturbances and experimentation at reduced spatial and temporal scales is the only available means for better understanding the UMRS and for identifying viable management alternatives.

Study Areas

The LTRMP study areas include six river reaches within the Upper Mississippi River System, five on the Mississippi River and one on the Illinois River (Figure). Study areas are referred to herein by the navigation pool designations according to the U.S. Army Corps of Engineers lock and dam system. Mississippi River navigation pools studied are Pool 4 (river mile 752 to 797), Pool 8 (679 to 703), Pool 13 (523 to 557), Pool 26 (202 to 242), and an unimpounded, open river reach (29 to 80). The remaining study area is the La Grange Pool of the Illinois River (80 to 158).

The LTRMP study areas were chosen, in part, to reflect important differences in geomorphology, floodplain land-use practices, and navigation management strategies that exist within the UMRS (Table 1). Pools 4, 8, and 13 are located in an upper impounded reach characterized by high percentages of open water and aquatic vegetation and low agricultural use (Figure). Relatively high percentages of the total aquatic area in these study reaches are composed of contiguous (to the main channel) backwaters, and relatively low percentages are composed of main channel. Qualitatively, Pools 4, 8, and 13 are geomorphically complex and richly braided by side channels and backwaters. Pool 26, in a lower impounded reach, is characterized by relatively low percentages of open water and aquatic vegetation and a high percentage of agriculture in the floodplain. A low percentage of the total aquatic area is composed of contiguous backwaters, and commensurately, a high percentage is composed of the main channel. The Open River study reach is characterized by low percentages of open water and aquatic vegetation and 71.5% agriculture in the floodplain. Of the total aquatic area in the Open River study reach, only 1.8% is contiguous backwater and 79% is main channel (Table 1). The La Grange Pool is similar to Pool 26 in floodplain composition, but is similar to Pools 8 and 13 in composition of the aquatic area (Table 1). In fact, the La Grange Pool has the greatest percentage (52.2%) of contiguous backwaters among the six LTRMP study areas.

Sampling sites are randomly selected within nine strata for each study area: backwater contiguous shoreline (BWCS), backwater contiguous offshore (BWCO), impounded shoreline (IMPS), impounded offshore (IMPO), main channel border unstructured (MCBU), main channel border wing dam (MCBW), side channel border (SCB), tributary mouth (TRI), and tailwater (TWZ). The definitions of sampling strata are based on geomorphic regions that have been mapped and entered into a Geographical Information System.

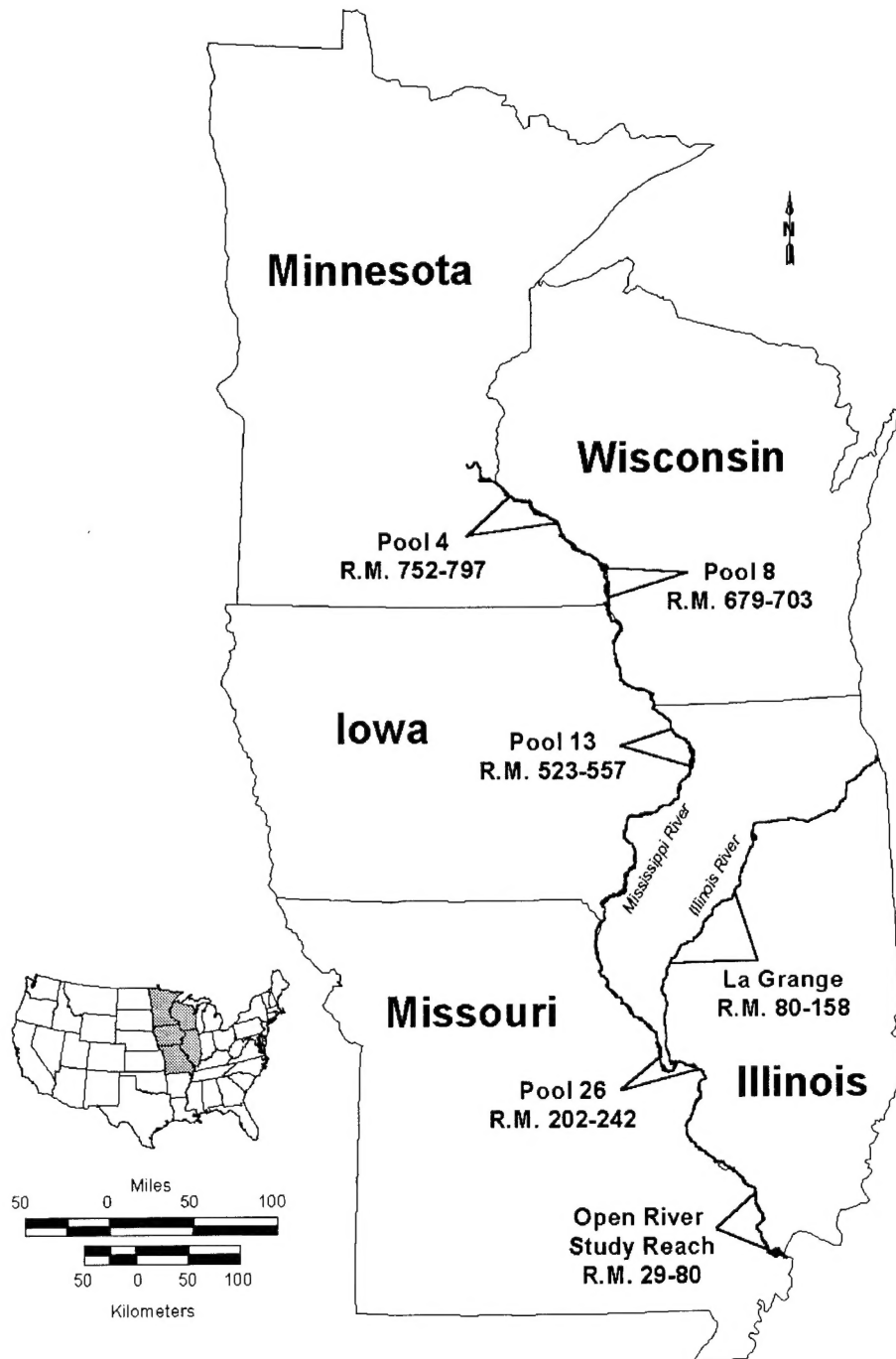


Figure. Long Term Resource Monitoring Program study reaches.

Table 1. Key features of the floodplain and aquatic area compositions of the Long Term Resource Monitoring Program's five Mississippi and Illinois River study reaches. Aquatic area is that portion of the floodplain that is inundated at normal water elevations. Main channel includes area in the navigation channel and main channel border areas. Data on floodplain composition are from Lastrup and Lowenberg (1994). Data on the composition of aquatic areas are from the Long Term Resource Monitoring Program aquatic areas spatial data base.

Study reach	Floodplain area (ha)	Floodplain composition (%)			Aquatic area composition (%)	
		Open water	Aquatic vegetation	Agriculture	Contiguous backwater	Main channel
Pool 4	28,358	50.5	10.0	12.1	21.3	10.5
Pool 8	19,068	40.1	14.4	0.9	30.6	14.2
Pool 13	34,528	29.7	8.6	27.9	28.5	24.7
Pool 26	51,688	13.4	1.4	65.4	17.3	54.4
Open River	105,244	9.9	0.6	71.5	1.8	79.0
La Grange Pool, Illinois River	89,554	15.7	2.2	59.6	52.2	21.3

Methods

Sampling Methods

The LTRMP fish monitoring design and sampling protocols, including historical changes, are given in Gutreuter et al. (1995). Readers requiring detailed descriptions should refer to that report. An abbreviated description of the LTRMP design and protocols follows; a list of common and scientific names of fish used in this report is found in Table 2.

In this report, we summarize the annual increment of fish data obtained by the LTRMP from stratified random and fixed-site sampling during 1995. The LTRMP converted to a stratified, random fish sampling design in 1993, augmented with limited sampling at a few permanently fixed sites. Selected aquatic areas, chosen for their enduring geomorphic features (Wilcox 1993), were used as sampling strata. These aquatic areas were largely compatible with the habitat classes used in 1990–92, with the exception of the 1990–92 classifications, which were based on the presence of aquatic vegetation; those fixed sites were reclassified into strata according to aquatic areas. Each aquatic area is artificially partitioned into 50-m² sampling grids beginning with a random origin for each LTRMP study reach (Gutreuter et al. 1995) using the ARC Geographic Information System. Beginning in 1993, sampling sites were randomly chosen from this lattice of square grids. Whenever it is discovered that a randomly selected site cannot be sampled because of environmental constraints (e.g., limited physical access or high flow), the nearest accessible site from a list of randomly selected alternate sites is sampled within the same aquatic area class.

Table 2. Long Term Resource Monitoring Program list of fishes, arranged phylogenetically by family, then alphabetically by genus and species. Hybrids are listed after respective genera. Nomenclature follows Robins et al. (1991).

Common name	Family name	Scientific name
Petromyzontidae		
Chestnut lamprey		<i>Ichthyomyzon castaneus</i>
Northern brook lamprey		<i>I. fossor</i>
Silver lamprey		<i>I. unicuspis</i>
Least brook lamprey		<i>Lampetra aepyptera</i>
American brook lamprey		<i>L. appendix</i>
Sea lamprey		<i>Petromyzon marinus</i>
Carcharhinidae		
Bull shark		<i>Carcharhinus leucas</i>
Acipenseridae		
Lake sturgeon		<i>Acipenser fulvescens</i>
Pallid sturgeon		<i>Scaphirhynchus albus</i>
Shovelnose sturgeon		<i>S. platyrhynchus</i>
Polyodontidae		
Paddlefish		<i>Polyodon spathula</i>
Lepisosteidae		
Spotted gar		<i>Lepisosteus oculatus</i>
Longnose gar		<i>L. osseus</i>
Shortnose gar		<i>L. platostomus</i>
Alligator gar		<i>L. spatula</i>
Amiidae		
Bowfin		<i>Amia calva</i>
Hiodontidae		
Goldeye		<i>Hiodon alosoides</i>
Mooneye		<i>H. tergisus</i>
Anguillidae		
American eel		<i>Anguilla rostrata</i>
Clupeidae		
Alabama shad		<i>Alosa alabamae</i>
Skipjack herring		<i>A. chrysochloris</i>
Alewife		<i>A. pseudoharengus</i>
Gizzard shad		<i>Dorosoma cepedianum</i>
Threadfin shad		<i>D. petenense</i>

Table 2: Continued.

Common name	Family name	Scientific name
Cyprinidae		
Central stoneroller		<i>Camptostoma anomalum</i>
Largescale stoneroller		<i>C. oligolepis</i>
Goldfish		<i>Carassius auratus</i>
Lake chub		<i>Couesius plumbeus</i>
Grass carp		<i>Ctenopharyngodon idella</i>
Red shiner		<i>Cyprinella lutrensis</i>
Spotfin shiner		<i>C. spiloptera</i>
Blacktail shiner		<i>C. venusta</i>
Steelcolor shiner		<i>C. whipplei</i>
Common carp		<i>Cyprinus carpio</i>
Goldfish × common carp		<i>Carassius auratus</i> × <i>C. carpio</i>
Gravel chub		<i>Erimystax x-punctatus</i>
Western silvery minnow		<i>Hybognathus argyritis</i>
Brassy minnow		<i>H. hankinsoni</i>
Mississippi silvery minnow		<i>H. nuchalis</i>
Plains minnow		<i>H. placitus</i>
Silver carp		<i>Hypophthalmichthys molitrix</i>
Bighead carp		<i>H. nobilis</i>
Striped shiner		<i>Luxilus chrysocephalus</i>
Common shiner		<i>L. cornutus</i>
Rosefin shiner		<i>Lythrurus ardens</i>
Ribbon shiner		<i>L. fumeus</i>
Redfin shiner		<i>L. umbratilis</i>
Speckled chub		<i>Macrhybopsis aestivalis</i>
Sturgeon chub		<i>M. gelida</i>
Sicklefin chub		<i>M. meeki</i>
Silver chub		<i>M. storeriana</i>
Pearl dace		<i>Margariscus margarita</i>
Hornyhead chub		<i>Nocomis biguttatus</i>
River chub		<i>N. micropogon</i>
Golden shiner		<i>Notemigonus crysoleucas</i>
Bigeye chub		<i>Notropis amblops</i>
Pallid shiner		<i>N. amnis</i>
Pugnose shiner		<i>N. anogenus</i>
Emerald shiner		<i>N. atherinoides</i>
River shiner		<i>N. blennius</i>
Bigeye shiner		<i>N. boops</i>
Silverjaw minnow		<i>N. buccatus</i>
Ghost shiner		<i>N. buechanani</i>
Ironcolor shiner		<i>N. chalybaeus</i>
Bigmouth shiner		<i>N. dorsalis</i>
Blackchin shiner		<i>N. heterodon</i>
Blacknose shiner		<i>N. heterolepis</i>
Bluehead shiner		<i>N. hubbsi</i>
Spottail shiner		<i>N. hudsonius</i>
Ozark minnow		<i>N. nubilus</i>
Rosyface shiner		<i>N. rubellus</i>
Silverband shiner		<i>N. shumardi</i>
Sand shiner		<i>N. stramineus</i>
Weed shiner		<i>N. texanus</i>
Mimic shiner		<i>N. volucellus</i>

Table 2. Continued.

Common name	Family name	Scientific name
Channel shiner		<i>N. wickliffi</i>
Pugnose minnow		<i>Opsopoeodus emiliae</i>
Suckermouth minnow		<i>Phenacobius mirabilis</i>
Northern redbelly dace		<i>Phoxinus eos</i>
Southern redbelly dace		<i>P. erythrogaster</i>
Bluntnose minnow		<i>Pimephales notatus</i>
Fathead minnow		<i>P. promelas</i>
Bullhead minnow		<i>P. vigilax</i>
Flathead chub		<i>Platygobio gracilis</i>
Blacknose dace		<i>Rhinichthys atratulus</i>
Longnose dace		<i>R. cataractae</i>
Creek chub		<i>Semotilus atromaculatus</i>
Catostomidae		
River carpsucker		<i>Carpionodes carpio</i>
Quillback		<i>C. cyprinus</i>
Highfin carpsucker		<i>C. velifer</i>
Longnose sucker		<i>Catostomus catostomus</i>
White sucker		<i>C. commersoni</i>
Blue sucker		<i>Cycleptus elongatus</i>
Creek chubsucker		<i>Erimyzon oblongus</i>
Lake chubsucker		<i>E. sucetta</i>
Northern hog sucker		<i>Hypentelium nigricans</i>
Smallmouth buffalo		<i>Ictiobus bubalus</i>
Bigmouth buffalo		<i>I. cyprinellus</i>
Black buffalo		<i>I. niger</i>
Spotted sucker		<i>Minytrema melanops</i>
Silver redhorse		<i>Moxostoma anisurum</i>
River redhorse		<i>M. carinatum</i>
Black redhorse		<i>M. duquesnei</i>
Golden redhorse		<i>M. erythrurum</i>
Shorthead redhorse		<i>M. macrolepidotum</i>
Greater redhorse		<i>M. valenciennesi</i>
Ictaluridae		
White catfish		<i>Ameiurus catus</i>
Black bullhead		<i>A. melas</i>
Yellow bullhead		<i>A. natalis</i>
Brown bullhead		<i>A. nebulosus</i>
Blue catfish		<i>Ictalurus furcatus</i>
Channel catfish		<i>I. punctatus</i>
Mountain madtom		<i>Noturus eleutherus</i>
Slender madtom		<i>N. exilis</i>
Stonecat		<i>N. flavus</i>
Tadpole madtom		<i>N. gyrinus</i>
Brindled madtom		<i>N. miurus</i>
Freckled madtom		<i>N. nocturnus</i>
Northern madtom		<i>N. stigmosus</i>
Flathead catfish		<i>Pylodictis olivaris</i>

Table 2. Continued.

Common name	Family name	Scientific name
	Esocidae	
Grass pickerel		<i>Esox americanus vermiculatus</i>
Northern pike		<i>E. lucius</i>
Muskellunge		<i>E. masquinongy</i>
Tiger muskellunge		<i>E. masquinongy</i> × <i>E. lucius</i>
Chain pickerel		<i>E. niger</i>
	Umbridae	
Central mudminnow		<i>Umbra limi</i>
	Osmeridae	
Rainbow smelt		<i>Osmerus mordax</i>
	Salmonidae	
Cisco		<i>Coregonus artedii</i>
Bloater		<i>C. hoyi</i>
Coho salmon		<i>Oncorhynchus kisutch</i>
Rainbow trout		<i>O. mykiss</i>
Brown trout		<i>Salmo trutta</i>
Brook trout		<i>Salvelinus fontinalis</i>
	Percopsidae	
Trout-perch		<i>Percopsis omiscomaycus</i>
	Aphredoderidae	
Pirate perch		<i>Aphredoderus sayanus</i>
	Amblyopsidae	
Spring cavefish		<i>Chologaster agassizi</i>
	Gadidae	
Burbot		<i>Lota lota</i>
	Cyprinodontidae	
Northern studfish		<i>Fundulus catenatus</i>
Banded killifish		<i>F. diaphanus</i>
Starhead topminnow		<i>F. dispar</i>
Blackstripe topminnow		<i>F. notatus</i>
Blackspotted topminnow		<i>F. olivaceus</i>
	Poeciliidae	
Western mosquitofish		<i>Gambusia affinis</i>

Table 2. Continued.

Common name	Family name	Scientific name
Atherinidae		
Brook silverside		<i>Labidesthes sicculus</i>
Mississippi silverside		<i>Menidia audens</i>
Inland silverside		<i>M. beryllina</i>
Gasterosteidae		
Brook stickleback		<i>Culaea inconstans</i>
Ninespine stickleback		<i>Pungitius pungitius</i>
Cottidae		
Mottled sculpin		<i>Cottus bairdi</i>
Banded sculpin		<i>C. carolinae</i>
Slimy sculpin		<i>C. cognatus</i>
Deepwater sculpin		<i>Myoxocephalus thompsoni</i>
Percichthyidae		
White perch		<i>Morone americana</i>
White bass		<i>M. chrysops</i>
Yellow bass		<i>M. mississippiensis</i>
Striped bass		<i>M. saxatilis</i>
White bass × striped bass		<i>M. chrysops</i> × <i>M. saxatilis</i>
Centrarchidae		
Shadow bass		<i>Ambloplites ariommus</i>
Rock bass		<i>A. rupestris</i>
Flier		<i>Centrarchus macropterus</i>
Banded pygmy sunfish		<i>Elassoma zonatum</i>
Green sunfish		<i>Lepomis cyanellus</i>
Pumpkinseed		<i>L. gibbosus</i>
Warmouth		<i>L. gulosus</i>
Orangespotted sunfish		<i>L. humilis</i>
Bluegill		<i>L. macrochirus</i>
Longear sunfish		<i>L. megalotis</i>
Redear sunfish		<i>L. microlophus</i>
Spotted sunfish		<i>L. punctatus</i>
Bantam sunfish		<i>L. symmetricus</i>
Green sunfish × pumpkinseed		<i>L. cyanellus</i> × <i>L. gibbosus</i>
Green sunfish × warmouth		<i>L. cyanellus</i> × <i>L. gulosus</i>
Green sunfish × orangespotted sunfish		<i>L. cyanellus</i> × <i>L. humilis</i>
Green sunfish × bluegill		<i>L. cyanellus</i> × <i>L. macrochirus</i>
Green sunfish × reardear sunfish		<i>L. cyanellus</i> × <i>L. microlophus</i>
Green sunfish × unknown		<i>L. cyanellus</i> × sp.
Pumpkinseed × warmouth		<i>L. gibbosus</i> × <i>L. gulosus</i>
Pumpkinseed × orangespotted sunfish		<i>L. gibbosus</i> × <i>L. humilis</i>
Pumpkinseed × bluegill		<i>L. gibbosus</i> × <i>L. macrochirus</i>
Orangespotted sunfish × longear sunfish		<i>L. humilis</i> × <i>L. megalotis</i>
Bluegill × warmouth		<i>L. macrochirus</i> × <i>L. gulosus</i>
Bluegill × orangespotted sunfish		<i>L. macrochirus</i> × <i>L. humilis</i>

Table 2. Continued.

Common name	Family name	Scientific name
Bluegill × longear sunfish		<i>L. macrochirus</i> × <i>L. megalotis</i>
Bluegill × redear sunfish		<i>L. macrochirus</i> × <i>L. microlophus</i>
Redear sunfish × warmouth		<i>L. microlophus</i> × <i>L. gulosus</i>
Smallmouth bass		<i>Micropterus dolomieu</i>
Spotted bass		<i>M. punctulatus</i>
Largemouth bass		<i>M. salmoides</i>
White crappie		<i>Pomoxis annularis</i>
Black crappie		<i>P. nigromaculatus</i>
White crappie × black crappie		<i>P. annularis</i> × <i>P. nigromaculatus</i>
Percidae		
Crystal darter		<i>Ammocrypta asprella</i>
Western sand darter		<i>A. clara</i>
Eastern sand darter		<i>A. pellucida</i>
Mud darter		<i>Etheostoma asprigene</i>
Greenside darter		<i>E. blennioides</i>
Rainbow darter		<i>E. caeruleum</i>
Bluebreast darter		<i>E. camurum</i>
Bluntnose darter		<i>E. chlorosomum</i>
Iowa darter		<i>E. exile</i>
Fantail darter		<i>E. flabellare</i>
Slough darter		<i>E. gracile</i>
Harlequin darter		<i>E. histrio</i>
Stripetail darter		<i>E. kennicotti</i>
Least darter		<i>E. microperca</i>
Johnny darter		<i>E. nigrum</i>
Cypress darter		<i>E. proelaire</i>
Orangethroat darter		<i>E. spectabile</i>
Spottail darter		<i>E. squamiceps</i>
Banded darter		<i>E. zonale</i>
Yellow perch		<i>Perca flavescens</i>
Logperch		<i>Percina caprodes</i>
Blackside darter		<i>P. maculata</i>
Slenderhead darter		<i>P. phoxocephala</i>
Dusky darter		<i>P. sciera</i>
River darter		<i>P. shumardi</i>
Sauger		<i>Stizostedion canadense</i>
Walleye		<i>S. vitreum</i>
Sauger × walleye		<i>S. canadense</i> × <i>S. vitreum</i>
Sciaenidae		
Freshwater drum		<i>Aplodinotus grunniens</i>
Mugilidae		
Striped mullet		<i>Mugil cephalus</i>

Since 1990, the LTRMP uses day and night electrofishing, fyke nets, seines, small mini fyke nets, hoop nets, and small trawls to sample fish in various strata. The following is a summary of sampling gears according to Gutreuter et al. (1995):

Electrofishing

Electrofishing is conducted with pulsed direct current; boat configuration and power output are standardized (Burkhardt and Gutreuter 1995; Gutreuter et al. 1995). Electrofishing effort is of 15-min duration and is paced so that the boat covers a rectangle of about 200×30 m. Day and night electrofishing data from these two methods were combined for length–frequency analysis. The unit of effort is a 15-min run.

Hoop Netting

The LTRMP uses two sizes of hoop nets. The large nets are composed of seven fiberglass hoops with diameters of 1.1 to 1.2 m. These nets are 4.8 m long, contain two finger-style throats, and are constructed of 3.7-cm (bar measure) nylon mesh. The small nets are composed of seven fiberglass hoops with diameters of 0.5 to 0.6 m. The small nets are 3 m long, contain two finger-style throats, and are constructed of 1.8-cm (bar measure) nylon mesh. Hoop nets are deployed separately but in pairs within sampling sites. Both nets are baited with 3 kg of soybean cake. For this report, the estimates from pairs of nets are pooled and therefore treated as a single gear for consistency with the 1990–92 data. The unit of effort is a net-day, which is 24 h of effort by a pair of nets.

Seining

The LTRMP uses 10.7-m-long seines constructed of 3-mm Ace-type nylon mesh. These seines are 1.8 m high and have a 0.9-m^2 bag in the centers. Seines are extended perpendicularly to shorelines and then swept in a 90° arc downstream to the shoreline. The unit of effort is a haul.

Fyke Netting

The LTRMP uses Wisconsin-type fyke nets (trap nets) that contain three sections: the lead, frame, and cab. All netting is 1.8-cm (bar measure) mesh. Leads are 15 m long and 1.3 m high. The spring steel frames are 0.9 m high and 1.8 m wide with two internal wing throats. The cabs are constructed of six steel hoops (0.9 m in diameter) containing two throats. These nets are fished singly from shoreline or from beds of dense vegetation or in tandem (with leads connected) offshore. The unit of effort is a net-day, where each frame is one net. Fyke net and tandem fyke net data were combined for length–frequency distribution analysis.

Mini Fyke Netting

Mini fyke nets are small, Wisconsin-type fyke nets. Mesh size is 3-mm Ace-type nylon. The leads are 4.5 m long and 0.6 m high. The spring steel frames are 0.6 m high and 1.2 m wide with two internal wing throats. The cabs are constructed of two steel hoops (0.6 m in diameter) with one throat. These nets are fished singly from shoreline or from beds of dense vegetation or in tandem (with leads connected) offshore. The unit of effort is a net-day, where each frame is one net.

Trawling

Trawling is conducted only at permanently fixed sampling sites in tailwater zones and unstructured channel borders. The LTRMP trawls collect mainly small, bottom-dwelling fish. The trawls are two-seam, 4.8-m slingshot balloon trawls (TRL16BC, Memphis Net and Twine Co., Inc., or the equivalent). The body of the trawl is made of No. 9 nylon with stretch mesh 18 mm in diameter. The cod end is made of No. 18 nylon with stretch mesh 18 mm in diameter. The cod end contains a 1.8-m liner consisting of 3-mm Ace-type nylon mesh. Floats are spaced every 0.91 m along the headrope, and a 4.8-mm steel chain is tied to the footrope. The trawl is equipped with 37-cm-high by 75-cm-long iron "V" doors (otter boards). These trawls are dragged downriver by small, flat-bottomed boats. Trawl speed is barely faster than ambient current speed. The standard unit of trawl effort is a haul. A minimum of six hauls is collected in main or side channel sites and four hauls at tailwater sites.

Gill Netting

In 1993, gill nets became an optional experimental sampling gear. This option was included to improve monitoring capabilities for some large riverine species. Gill nets are 91.44 m long and consist of four, 22.86-m panels of monofilament mesh. The panels are 2.44 m deep. Each panel consists of different mesh of 10.2-, 20.3-, and 25.4-cm stretch measure. The 10.2- and 15.2-cm mesh are woven from No. 8 (9.07-kg [20-pound] test) transparent nylon monofilament. The 25.4-cm mesh is woven from No. 12 (13.61-kg [30-pound] test) transparent nylon monofilament. The top line is floating foam-core rope and the bottom line is 29.50-kg lead-core rope. Gill nets are set either perpendicularly (preferred) or parallel (in high-flow conditions) to the shoreline. The standard unit of gill netting effort is the net-day, where a day is 24 h.

Trammel Netting

In 1994, trammel nets became an optional experimental sampling gear. This option was included to improve monitoring capabilities for some large riverine species. Trammel nets may be anchored or drifted with the current.

Trammel nets are 91.44 m × 2.44 m, inside netting is 10.16-cm bar of No. 8 monofilament hung about 85 m per 30.48 m of finished net, wall size is 35.56-cm bar of No. 9 multifilament twine hung 61 m per 30.48 yards of finished net, float line is 1.27 cm foam-core (two strands on the floating nets, one strand on the bottom set nets), and lead line is lead-core (No. 20 on the floating net, No. 65 on the sinking net).

Statistical Methods

The LTRMP uses mean catch-per-unit-effort C/f as an index of abundance, as is conventional practice (Ricker 1975). The units of effort are specific to particular gears. For electrofishing and seining, effort is a constant, but for other gears it is somewhat variable. For example, although the effort goal for fyke nets is 1 day (Gutreuter et al. 1995), actual effort may vary between 20 and 30 h. Catch and effort are recorded for each species from individual samples (deployments of particular gears at unique combinations of time and place. Whenever a species is not caught in a sample, the catch for that species in that sample is zero. Although these zero catches are not recorded, they are reconstructed for analyses.

The estimates of pooled reachwide mean *C/f* were obtained from the conventional design-based estimator for stratified random samples (Cochran 1977). For an arbitrary random variable *y* (for this report *y* represents *C/f*), the pooled mean, denoted \bar{y}_{st} (*st* represents stratified) is given by

$$\bar{y}_{st} = \frac{1}{N} \sum_{h=1}^L N_h \bar{y}_h \quad (1)$$

where N_h is the number of sampling units within stratum *h*, $N = \sum_{h=1}^L N_h$, and \bar{y}_h denotes the estimator of the simple mean of *y* for stratum *h*. The estimator of the variance of \bar{y}_{st} is

$$s^2(\bar{y}_{st}) = \frac{1}{N^2} \sum_{h=1}^L N_h (N_h - n_h) \left(\frac{s_h^2}{n_h} \right) \quad (2)$$

where

$$s_h^2 = \frac{\sum_{i=1}^{n_h} (y_{hi} - \bar{y}_h)^2}{n_h - 1}$$

is the usual estimator of the variance of y_h and n_h is the number of samples taken in stratum *h* (Cochran 1977). The standard error of \bar{y}_{st} is therefore $s(\bar{y}_{st})$. For LTRMP fish monitoring, the sampling units are 50-m² sampling grids.

In this report, *C/f* statistics are reported separately for the limited, fixed-site sampling and the primary stratified random sampling. Equation (1) is used to estimate means of data obtained from fixed-site sampling to maintain computational consistency. The pooled means from fixed-site sampling are not guaranteed unbiased because there is no assurance that the fixed sites were unbiased within the stratum. Equation (1) is also used to obtain estimates of overall mean catch-per-unit-effort from stratified random sampling. In random samples, equation (1) yields unbiased estimates of the pooled means regardless of the probability distribution of *y* (Cochran 1977).

Length distribution analysis was performed for 13 selected fish species (gear used): gizzard shad (electrofishing), common carp (electrofishing), smallmouth buffalo (electrofishing; large and small hoop netting), channel catfish (electrofishing; large and small hoop netting), northern pike (electrofishing; fyke and tandem fyke netting), white bass (electrofishing), bluegill (electrofishing; fyke and tandem fyke netting), largemouth bass (electrofishing), white crappie (electrofishing; fyke and tandem fyke netting), black crappie (electrofishing; fyke and tandem fyke netting), sauger (electrofishing), walleye (electrofishing), and freshwater drum (electrofishing; fyke and tandem fyke netting). The data are illustrated in the form of histograms within the following chapters. In some instances, meaningful biological interpretation of these distributions may be limited by small sample size or size selectivity of the gear (Anderson and Neumann 1996). Some fish histograms with small sample sizes (<100) are included in this report because of local interest, while others were omitted (reach dependent).

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References

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447–482 in B. R. Murphy and D. W. Willis, editors. *Fisheries techniques*. 2nd edition. American Fisheries Society, Bethesda, Maryland.
- Burkhardt, R. W., and S. Gutreuter. 1995. Improving electrofishing catch consistency by standardizing power. *North American Journal of Fisheries Management* 15:375–381.
- Cahn, A. R. 1929. The effect of carp on a small lake: The carp as a dominant. *Ecology* 10:271–274.
- Cochran, W. G. 1977. *Sampling techniques*. 3rd edition. John Wiley & Sons, New York. 428 pp.
- Fremling, C. R., J. L. Rasmussen, R. E. Sparks, S. P. Cobb, C. F. Bryan, and T. O. Clafin. 1989. Mississippi River fisheries: A case history. Pages 309–351 in D. P. Dodge, editor. *Proceedings of the International Large River Symposium*, Department of Fisheries and Oceans, Ottawa, Ontario, Canada. Canadian Special Publication of Fisheries and Aquatic Sciences 106.
- Gutreuter, S., R. Burkhardt, and K. Lubinski. 1995. Long Term Resource Monitoring Program Procedures: Fish monitoring. National Biological Service, Environmental Management Technical Center, Onalaska, Wisconsin, July 1995. LTRMP 95-P002-1. 42 pp. + Appendixes A–J
- Lastrup, M. S., and C. D. Lowenberg. 1994. Development of a systemic land cover/land use database for the Upper Mississippi River System derived from Landsat Thematic Mapper satellite data. National Biological Survey, Environmental Management Technical Center, Onalaska, Wisconsin, May 1994. LTRMP 94-T001. 103 pp.
- Macrae, D. A. 1979. The impact of carp on the summer production of aquatic vegetation as indicated by an enclosure experiment and food habits study. M.S. Thesis, Trent University, Peterborough, Ontario, Canada. 110 pp.
- Northcote, T. G. 1988. Fish in the structure and function of freshwater ecosystems: A "top-down" view. *Canadian Journal of Fisheries and Aquatic Sciences* 45:361–379.
- Pitlo J., A. Van Vooren, and J. Rasmussen. 1995. Distribution and relative abundance of Upper Mississippi River fishes. Upper Mississippi River Conservation Committee, Rock Island, Illinois. 20 pp.

- Ricker, W. E. 1975. Computation and interpretation of biological statistics of fish populations. Bulletin 191. Fisheries Research Board of Canada, Ottawa, Ontario. 382 pp.
- Robins, C. R., R. M. Bailey, C. E. Bond, J. R. Brooker, E. A. Lachner, R. N. Lea, and W. B. Scott. 1991. Common and scientific names of fishes from the United States and Canada. 5th edition. Special Publication 20. American Fisheries Society, Bethesda, Maryland. 183 pp.
- Smith, P. W. 1979. The fishes of Illinois. University of Illinois Press, Urbana. 314 pp.
- Sparks, R. E., P. B. Bayley, S. L. Kohler, and L. L. Osborne. 1990. Disturbance and recovery of large floodplain rivers. *Environmental Management* 14:699-709.
- UMRCC. 1989. Upper Mississippi River commercial fisheries statistics for 1987. Pages 145-151 in *Proceedings of the forty-fifth annual meeting of the Upper Mississippi River Conservation Committee*. Upper Mississippi River Conservation Committee, Rock Island, Illinois.
- Welcomme, R. L., R. A. Ryder, and J. A. Sedell. 1989. Dynamics of fish assemblages in river systems—A synthesis. Pages 577-599 in D. P. Dodge, editor. *Proceedings of the International Large River Symposium*, Department of Fisheries and Oceans, Ottawa, Ontario, Canada. Canadian Special Publication of Fisheries and Aquatic Sciences 106.
- Wilcox, D. B. 1993. An aquatic habitat classification system for the Upper Mississippi River System. U.S. Fish and Wildlife Service, Environmental Management Technical Center, Onalaska, Wisconsin, May 1993. EMTC 93-T003. 9 pp. + Appendix A (NTIS # PB93-208981)
- Wlosinski, J. H., D. E. Hansen, and S. R. Hagedorn. 1995. Long Term Resource Monitoring Program Procedures: Water surface elevation and discharge. National Biological Service, Environmental Management Technical Center, Onalaska, Wisconsin, August 1995. LTRMP 95-P002-4. 9 pp. + Appendixes A-O
- U.S. Fish and Wildlife Service. 1993. Operating Plan for the Upper Mississippi River System Long Term Resource Monitoring Program. Environmental Management Technical Center, Onalaska, Wisconsin, Revised September 1993. EMTC 91-P002R. 179 pp. (NTIS #PB94-160199)

Chapter 1. Pool 4, Upper Mississippi River

by

Mark Stopyro

Minnesota Department of Natural Resources
1801 S. Oak Street
Lake City, Minnesota 55041

Hydrograph

Water levels in the tailwaters of Lock and Dam 3 were from 1 to 4 feet above the postimpoundment mean elevations (since 1940) most of the time from mid-June through October (Figure 1.1).

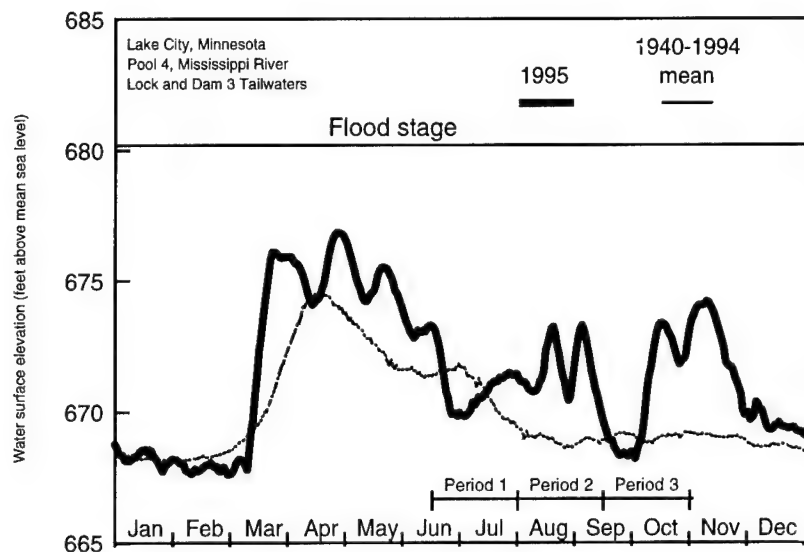


Figure 1.1. Daily water surface elevation from Lock and Dam 3 for Pool 4, Upper Mississippi River, during 1995 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

Summary of Sampling Effort

In 1995 we completed 457 collections, which comprised 383 collections at randomly selected sites and 74 collections at fixed sites (Table 1.1). Fixed-site samples included 48 collections in the TWZ and 26 collections in the MCBW in the upper pool. High flows during most of the second period precluded the effective use of fyke and mini fyke nets at random and fixed wing dam sites.

Total Catch by Gear

We collected 136,425 fish comprising 59 species and 3 hybrids in 1995 (Table 1.2). Historically, 99 species have been documented in Pool 4 (Pitlo et al. 1995). In 1995, the most numerically abundant species were the emerald shiner (120,950), gizzard shad (3,184), common carp (1,350), freshwater drum (1,264), and white bass (1,260). Total catches by gear were day electrofishing, 6,530; night electrofishing, 2,816; fyke net, 1,544; tandem fyke net, 1,844; mini fyke, 114,701; tandem mini fyke, 452; seine, 7,178; small hoop net, 318; large hoop net, 633; gill net, 281; trammel net, 83; and trawl, 45.

Random Sampling, Mean C/f by Gear and Stratum

Day Electrofishing

We collected 50 species using day electrofishing (Table 1.2). Species with the highest poolwide mean catch rates (Table 1.3.1) were the emerald shiner at 71/h (17.75/15-min run), gizzard shad (68/h), and common carp (21/h). The gizzard shad was the most commonly collected species in the BWCO (46/h), BWCS (90/h), and MCBW (27/h), and the emerald shiner predominated in the MCBU (132/h) and SCB (198/h). Six species taken by electrofishing were not collected by any other gear: American eel, blue sucker, burbot, chestnut lamprey, lake sturgeon, and slenderhead darter.

Fyke Net

Thirty species from among two strata were collected in fyke nets (Table 1.2). Poolwide catch rates in fyke nets (Table 1.3.2) were highest for the black crappie (65/h), bluegill (42/h), and gizzard shad (30/h). The black crappie had the highest stratumwide catch rate in the BWCS (65/h), and in the MCBW the highest catch rate was for the freshwater drum (25/h).

Tandem Fyke Net

Tandem fyke nets were deployed only in the BWCO and 30 species were collected (Table 1.2). The highest catch rates (Table 1.3.3) were for the freshwater drum, black crappie (12 each/net-day), and white bass (6/net-day).

Mini Fyke Net

We collected 38 species in mini fyke nets (Table 1.2). Poolwide catch rates (Table 1.3.4) were highest for the emerald shiner (56/net-day), bluegill (7/net-day), and logperch (3/net-day). The emerald shiner was the most abundant species in mini fyke net collections from the MCBU (203/net-day) and SCB (10/net-day). The bluegill was the most common species in collections from the BWCS (14/net-day) and the only species from the MCBW in mini fyke nets. One species, the weed shiner, was collected only by this gear.

Tandem Mini Fyke Net

Thirty species were collected by tandem mini fyke nets in the BWCO (Table 1.2). The most commonly collected species were the freshwater drum, bluegill (2 each/net-day), and gizzard shad (1/net-day; Table 1.3.5).

Small Hoop Net

Small hoop nets were used to collect 16 species (Table 1.2). Poolwide catch rates were highest for the common carp (1/net-day; Table 1.3.6). The common carp had the highest stratumwide catch rates in the MCBU and SCB (1 each/net-day). The channel catfish was the most commonly caught species in the MCBW (1/net-day).

Large Hoop Net

We collected 15 species in large hoop nets (Table 1.2). Poolwide, the most commonly caught species were the common carp and the smallmouth buffalo (1 each/net-day; Table 1.3.7). The common carp was the most frequently collected species in the BWCO and SCB (1/net-day) and MCBW (0.4/net-day). In the MCBU, the highest catch rate was for the smallmouth buffalo (2/net-day).

Seine

Poolwide catch rates in the seine (Table 1.3.8) were highest for the emerald shiner (104/haul), gizzard shad (7/haul), and river shiner. The emerald shiner was the most frequently collected species in the MCBU (156/haul) and SCB (63/haul). Thirty-six species were collected in the seine (Table 1.2), and western sand darters were collected exclusively by seining.

Gill Net

Gill nets were set solely in the BWCO and 19 species were collected (Table 1.2). The highest catch rates (Table 1.3.9) were for the common carp, white bass (6 each/net-day), and freshwater drum (4/net-day).

Trammel Net

Trammel nets were set in the BWCO and 11 species were collected (Table 1.2). The most frequently collected species (Table 1.3.10) were the common carp (3/net-day), bigmouth buffalo (2/net-day), and flathead catfish (0.6/net-day).

Fixed Sampling, Mean C/f by Gear and Stratum

Day Electrofishing

We caught 21 species in day electrofishing collections at two fixed sites in the MCBW (Table 1.4.1). The highest catch rates were for the shorthead redhorse (47/h), gizzard shad (27/h), and emerald shiner (26/h).

Night Electrofishing

We collected 32 species by night electrofishing at fixed sites in the TWZ (Table 1.2). The most frequently collected species (Table 1.4.2) were the emerald shiner (287/h), gizzard shad (199/h), and white bass (77/h).

Fyke Net

Fyke nets were set at fixed sites in the TWZ and MCBW. In the MCBW, the highest catch rates in fyke nets (Table 1.4.3) were for the freshwater drum (24/net-day), black crappie (17/net-day), and common carp

(5/net-day). Catch rates in the TWZ were highest for the white bass (27/net-day), black crappie (23/net-day), and freshwater drum (14/net-day).

Mini Fyke Net

Mini fyke net catch rates at fixed sites in the MCBW (Table 1.4.4) were highest for the black crappie (5/net-day), freshwater drum (2/net-day), and spotfin shiner (1/net-day). The most frequently collected species in mini fyke nets in the TWZ stratum were the emerald shiner (22,360/net-day), gizzard shad (24/net-day), and mimic shiner (79/net-day).

Small and Large Hoop Nets

The common carp was the most frequently collected species in small hoop nets (Table 1.4.5) in the MCBW (1/net-day) and TWZ (10/net-day). Catch rates in large hoop nets (Table 1.4.6) in the TWZ were highest for the common carp (23/net-day) and smallmouth buffalo and channel catfish (1 each/net-day). The most frequently caught species in the MCBW was the common carp (3/net-day).

Trawl

Catch rates in the trawl in the TWZ are reported for six species (Table 1.4.7). The freshwater drum, channel catfish (1 each/haul), and speckled chub (0.7/haul) were the most frequently caught species in the trawl.

Length Distributions of Selected Species

Gizzard Shad

The length distribution of 1,881 gizzard shad collected by electrofishing indicates a high catch of individuals less than 16 cm and a distinct group of fish from 24 to 30 cm (Figure 1.2). Gizzard shad exceeding 20 cm are infrequently collected in Pool 4 because of this species' high overwinter mortality. A total of 386 unmeasured gizzard shad are not represented in this length distribution.

Common Carp

The majority of the 511 common carp collected by electrofishing were between 40 and 66 cm in total length (Figure 1.3). Common carp less than 30 cm are infrequently collected in Pool 4.

Smallmouth Buffalo

The length distribution of 51 smallmouth buffalo collected by electrofishing shows a trimodal grouping with peaks at 16, 24, and 48 cm (Figure 1.4). Smallmouth buffalo collected in hoop nets ranged in length from 38 to 64 cm, and the modal length was 48 cm (Figure 1.5).

Channel Catfish

The modal length of 33 channel catfish collected by electrofishing was 54 cm (Figure 1.6). The 97 channel catfish collected in hoop nets ranged in length from 16 to 68 cm, and the catch was not dominated by any apparent strong year classes (Figure 1.7).

Northern Pike

The lengths of 32 northern pike collected by electrofishing ranged from 6 to 88 cm (Figure 1.8). Twenty-five northern pike were collected in fyke nets. Lengths of these fish ranged from 34 to 96 cm in total length (Figure 1.9).

White Bass

The length distribution of 568 white bass collected by electrofishing is presented in Figure 1.10. Lengths ranged from 2 to 44 cm, and the modal length was 16 cm.

Bluegill

The modal length of 434 bluegills collected by electrofishing was 6 cm, and the maximum length was 20 cm (Figure 1.11). Few bluegills longer than 14 cm were collected while electrofishing. Two hundred forty-nine bluegills ranging in length from 6 to 22 cm were collected in fyke nets (Figure 1.12). The modal length was 12 cm.

Largemouth Bass

The length distribution of 308 largemouth bass collected by electrofishing is presented in Figure 1.13. Lengths ranged from 4 to 46 cm, and the majority of individuals were from 6 to 14 cm long.

Black Crappie

We collected 1,015 black crappies with lengths from 6 to 34 cm in fyke nets (Figure 1.14). The majority of individuals were from 10 to 16 cm long.

Sauger

The length distribution of 348 saugers collected by electrofishing is presented in Figure 1.15. Lengths of saugers ranged from 6 to 48 cm, and the modal length was 22 cm long.

Walleye

The length distribution of 250 walleyes collected by electrofishing is presented in Figure 1.16. Individuals ranged from 8 to 60 cm in length.

Freshwater Drum

Freshwater drum collected by electrofishing ranged from 3 to 50 cm in length, and the modal length was 16 cm (Figure 1.17). Freshwater drum collected in fyke nets were from 10 to 46 cm long, and the distribution of lengths was strongly bimodal with peaks at 14 and 30 cm (Figure 1.18).

Table 1.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in Pool 4 of the Mississippi River during 1995. Table entries are numbers of successfully completed standardized monitoring collections.

Table page: 1

Sampling period = 1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	7	4	6	6	4					27
Fyke net	6				4				2	12
Gill net		4								4
Large hoop net		3	6	6	4				2	21
Small hoop net		4	6	6	4				2	22
Mini fyke net	6		6	4	4				2	22
Night electrofishing									4	4
Seine			12	8						20
Trawling									4	4
Trammel net (set)		4								4
Tandem fyke net		8								8
Tandem mini fyke net		8								8
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SUBTOTAL	19	35	36	30	20	0	0	0	16	156

Sampling period = 2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8	4	5	6	4					27
Fyke net	6								2	8
Gill net		4								4
Large hoop net		4	6	6	4				2	22
Small hoop net		4	6	6	4				2	22
Mini fyke net	6		6	4					2	18
Night electrofishing									4	4
Seine			8	8						16
Trawling									4	4
Trammel net (set)		4								4
Tandem fyke net		8								8
Tandem mini fyke net		8								8
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SUBTOTAL	20	36	31	30	12	0	0	0	16	145

Sampling period = 3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	5	6	7	5	4					27
Fyke net	6				4				2	12
Gill net		4								4
Large hoop net		4	7	5	4				2	22
Small hoop net		4	7	5	4				2	22
Mini fyke net	7		5	4	4				2	22
Night electrofishing									4	4
Seine			11	8						19
Trawling									4	4
Trammel net (set)		4								4
Tandem fyke net		8								8
Tandem mini fyke net		8								8
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SUBTOTAL	18	38	37	27	20	0	0	0	16	156
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
	57	109	104	87	52	0	0	0	48	457

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SBU - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 4 of the Mississippi River. See Table 1.1 for the list of sampling gears actually deployed in this study reach.

Table page: 1

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	1	-	-	-	-	-	-	-	-	-	-	-	1
2	Silver lamprey	Ichthyomyzon unicuspis	1	-	1	-	-	-	-	-	-	-	-	-	2
3	Lake sturgeon	Acipenser fulvescens	1	-	-	-	-	-	-	-	-	-	-	-	1
4	Shovelnose sturgeon	Scaphirhynchus platyrhynchus	-	-	-	-	-	-	-	-	1	-	-	1	2
5	Longnose gar	Lepisosteus osseus	2	-	7	3	-	-	1	-	-	3	-	-	16
6	Shortnose gar	Lepisosteus platostomus	-	2	5	3	5	-	1	-	-	-	-	-	16
7	Bowfin	Amia calva	32	-	20	29	5	1	-	-	-	6	2	-	95
8	Mooneye	Hiodon tergisus	6	1	-	10	-	-	-	-	3	-	-	-	20
9	American eel	Anguilla rostrata	1	2	-	-	-	-	-	-	-	-	-	-	3
10	Gizzard shad	Dorosoma cepedianum	1431	836	134	114	214	67	383	-	1	3	-	1	3184
11	Spotfin shiner	Cyprinella spiloptera	106	2	-	-	162	6	172	-	-	-	-	-	448
12	Common carp	Cyprinus carpio	438	74	63	69	13	9	3	195	379	74	33	-	1350
13	Speckled chub	Macrhybopsis aestivalis	-	-	-	-	57	-	1	-	-	-	-	8	66
14	Silver chub	Macrhybopsis storeriana	11	1	3	5	21	2	8	5	-	-	-	-	56
15	Golden shiner	Notemigonus crysoleucas	8	-	-	1	-	-	-	-	-	-	-	-	9
16	Emerald shiner	Notropis atherinoides	1617	790	-	-	112848	6	5689	-	-	-	-	-	120950
17	River shiner	Notropis blennioides	226	-	-	-	32	-	249	-	-	-	-	-	507
18	Spottail shiner	Notropis hudsonius	65	-	-	-	15	52	177	-	-	-	-	-	309
19	Weed shiner	Notropis texanus	-	-	-	-	1	-	-	-	-	-	-	-	1
20	Mimic shiner	Notropis volucellus	9	-	-	-	529	-	35	-	-	-	-	-	573
21	Pugnose minnow	Opsopoeodus emiliae	1	-	-	-	11	-	1	-	-	-	-	-	13
22	Bullhead minnow	Pimephales vigilax	9	1	-	-	51	1	65	-	-	-	-	-	127
23	River carpsucker	Carpiodes carpio	11	2	3	1	-	-	-	-	1	1	-	-	19
24	Quillback	Carpiodes cyprinus	89	3	-	4	-	2	29	-	-	6	-	-	133
25	Unidentified carpsucker	Carpiodes sp.	-	-	-	-	-	-	2	-	-	-	-	-	2
26	White sucker	Catostomus commersoni	5	-	4	3	1	-	1	1	-	-	-	-	15
27	Blue sucker	Cycleptus elongatus	3	-	-	-	-	-	-	-	-	-	-	-	3
28	Smallmouth buffalo	Ictiobus bubalus	38	13	2	11	-	1	1	4	107	12	3	-	192
29	Bigmouth buffalo	Ictiobus cyprinellus	10	13	-	-	-	1	1	-	-	-	30	-	55
30	Spotted sucker	Minytrema melanops	38	-	6	2	1	-	-	1	-	-	-	-	48
31	Silver redhorse	Moxostoma anisurum	129	-	109	49	12	4	-	5	14	16	2	-	340
32	River redhorse	Moxostoma carinatum	24	-	-	-	-	-	-	-	-	1	-	-	25
33	Golden redhorse	Moxostoma erythrurum	24	5	-	-	-	-	-	1	-	3	-	-	33
34	Shorthad redhorse	Moxostoma macrolepidotum	311	19	20	10	10	3	14	4	8	2	-	-	401
35	Unidentified redhorse	Moxostoma sp.	-	-	-	-	-	6	82	-	-	-	-	-	89
36	Unidentified sucker	Catostomid sp.	-	-	-	-	1	-	-	-	-	-	-	-	1
37	Yellow bullhead	Ameiurus natalis	-	-	3	1	-	1	-	-	-	-	-	-	5
38	Brown bullhead	Ameiurus nebulosus	-	-	1	1	-	1	-	-	-	-	-	-	3
39	Channel catfish	Ictalurus punctatus	30	3	1	6	5	-	-	52	45	15	1	18	176

Gears: D - Day electrofishing S - Seining
 N - Night electrofishing HS - Small hoop netting
 F - Fyke netting HL - Large hoop netting
 X - Tandem fyke netting G - Gill netting
 M - Mini fyke netting TA - Trammel netting, anchored sets
 Y - Tandem mini fyke netting T - Trawling (4.8-m bottom trawl)

Table 1.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 4 of the Mississippi River. See Table 1.1 for the list of sampling gears actually deployed in this study reach. Table page: 2

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Tadpole madtom	Noturus gyrinus	-	-	-	-	7	7	-	-	-	-	-	-	14
41	Flathead catfish	Pylodictis olivaris	6	12	5	-	5	-	-	3	7	1	7	-	46
42	Northern pike	Esox lucius	26	6	11	14	11	4	8	-	3	9	1	-	93
43	Trout-perch	Percopsis omiscomaycus	-	-	-	-	3	-	18	-	-	-	-	-	21
44	Burbot	Lota lota	2	3	-	-	-	-	-	-	-	-	-	-	5
45	White bass	Morone chrysops	350	218	206	259	85	29	45	1	8	59	-	-	1260
46	Rock bass	Ambloplites rupestris	65	7	10	28	9	6	10	8	-	-	-	-	143
47	Green sunfish	Lepomis cyanellus	5	27	-	-	4	-	1	-	-	-	-	-	37
48	Pumpkinseed	Lepomis gibbosus	4	-	1	-	-	-	-	-	-	-	-	-	5
49	Bluegill	Lepomis macrochirus	387	47	193	56	278	72	71	4	4	-	-	-	1112
50	Green sunfish x bluegill	L. cyanellus x L. macrochirus	2	2	-	-	-	-	-	-	-	-	-	-	4
51	Pumpkinseed x bluegill	L. gibbosus x L. macrochirus	-	2	-	-	-	-	-	-	-	-	-	-	2
52	Smallmouth bass	Micropterus dolomieu	236	52	1	3	7	5	37	-	-	-	-	-	341
53	Largemouth bass	Micropterus salmoides	283	25	2	1	57	6	39	-	-	-	-	-	413
54	White crappie	Pomoxis annularis	10	13	8	13	4	13	1	-	-	1	-	-	63
55	Black crappie	Pomoxis nigromaculatus	37	37	490	525	67	52	9	6	12	5	-	-	1240
56	Unidentified sunfish	Centrarchid sp.	-	-	-	-	4	-	1	-	-	-	-	-	5
57	Western sand darter	Ammocrypta clara	-	-	-	-	-	-	9	-	-	-	-	-	9
58	Mud darter	Etheostoma asprigene	-	-	-	-	14	-	1	-	-	-	-	-	15
59	Johnny darter	Etheostoma nigrum	6	-	-	-	14	5	36	-	-	-	-	-	61
60	Yellow perch	Perca flavescens	92	1	17	41	8	-	4	4	-	-	-	-	167
61	Logperch	Percina caprodes	66	5	-	-	113	10	34	-	-	-	-	-	228
62	Slenderhead darter	Percina phoxocephala	1	-	-	-	-	-	-	-	-	-	-	-	1
63	River darter	Percina shumardi	2	-	-	-	3	3	17	-	-	-	-	-	26
64	Sauger	Stizostedion canadense	82	266	5	18	4	2	2	-	-	-	1	-	380
65	Walleye	Stizostedion vitreum	66	184	2	9	-	1	-	-	-	10	2	-	274
66	Sauger x walleye	S. canadense x S. vitreum	3	1	-	-	-	-	-	-	-	-	-	-	4
67	Unidentified Stizostedion	Stizostedion sp.	-	-	-	-	1	-	-	-	-	-	-	-	1
68	Freshwater drum	Aplodinotus grunniens	122	141	211	555	15	80	5	24	40	54	1	16	1264
69	Unidentified	Unidentified	3	-	-	-	4	-	3	-	-	-	-	-	10
			=====												
			6533	2816	1544	1844	114712	458	7266	318	633	281	83	45	136533

Gears: D - Day electrofishing S - Seining
N - Night electrofishing HS - Small hoop netting
F - Fyke netting HL - Large hoop netting
X - Tandem fyke netting G - Gill netting
M - Mini fyke netting TA - Trammel netting, anchored sets
Y - Tandem mini fyke netting T - Trawling (4.8-m bottom trawl)

Table 1.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Chestnut lamprey	0.01 (0.01)							0.06 (0.06)		
Lake sturgeon	0.01 (0.01)		0.05 (0.05)							
Longnose gar	0.04 (0.03)	0.07 (0.07)				0.06 (0.06)				
Bowfin	0.45 (0.12)	0.14 (0.10)	1.10 (0.38)			0.06 (0.06)		0.41 (0.24)		
Mooneye	0.07 (0.04)	0.07 (0.07)	0.05 (0.05)			0.12 (0.12)	0.17 (0.17)	0.06 (0.06)		
American eel	0.01 (0.01)					0.06 (0.06)				
Gizzard shad	17.15 (4.61)	11.50 (5.83)	22.55 (7.08)			32.03 (22.47)	6.88 (4.83)	8.35 (2.67)		
Spotfin shiner	0.96 (0.26)		0.20 (0.14)			2.47 (1.19)		2.47 (0.82)		
Common carp	5.13 (0.54)	0.07 (0.07)	7.70 (1.12)			5.18 (0.99)	0.45 (0.33)	10.59 (2.02)		
Silver chub	0.04 (0.03)		0.05 (0.05)			0.18 (0.18)				
Golden shiner	0.12 (0.06)	0.07 (0.07)	0.30 (0.18)			0.06 (0.06)				
Emerald shiner	17.75 (5.36)	2.43 (1.13)	5.40 (2.22)			32.95 (14.45)	5.00 (5.00)	49.47 (23.43)		
River shiner	2.29 (0.86)		0.10 (0.07)			10.20 (4.04)		3.12 (2.77)		
Spottail shiner	0.94 (0.25)	0.50 (0.25)	2.30 (0.84)			0.41 (0.21)		0.29 (0.17)		
Mimic shiner	0.09 (0.05)		0.05 (0.05)			0.42 (0.30)		0.06 (0.06)		
Pugnose minnow	0.01 (0.01)		0.05 (0.05)							
Bullhead minnow	0.10 (0.04)		0.25 (0.14)			0.18 (0.13)				
River carpsucker	0.13 (0.05)		0.20 (0.12)					0.35 (0.17)		
Quillback	1.12 (0.33)	0.43 (0.20)	1.85 (0.98)			2.00 (1.08)		0.71 (0.33)		
White sucker	0.08 (0.04)	0.07 (0.07)	0.15 (0.11)					0.06 (0.06)		
Blue sucker							0.23 (0.23)			
Smallmouth buffalo	0.49 (0.19)	0.43 (0.29)	0.55 (0.28)			0.12 (0.12)	0.28 (0.18)	0.82 (0.65)		
Bigmouth buffalo	0.11 (0.05)		0.05 (0.05)			0.18 (0.18)		0.35 (0.21)		
Spotted sucker	0.53 (0.17)	0.07 (0.07)	1.80 (0.61)					0.06 (0.06)		
Silver redhorse	1.75 (0.35)	1.43 (0.54)	1.55 (0.69)			1.53 (0.46)		2.76 (1.00)		
River redhorse	0.17 (0.11)					0.76 (0.64)	1.13 (0.42)	0.24 (0.14)		
Golden redhorse	0.30 (0.08)	0.14 (0.10)	0.50 (0.22)			0.35 (0.15)		0.29 (0.17)		
Shorthead redhorse	2.24 (0.42)	0.21 (0.15)	2.90 (1.01)			3.25 (0.95)	5.81 (1.73)	4.12 (1.33)		
Channel catfish	0.29 (0.10)		0.20 (0.09)			1.00 (0.52)	0.21 (0.21)	0.35 (0.21)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Flathead catfish	0.05 (0.03)					0.18 (0.13)		0.12 (0.12)		
Northern pike	0.34 (0.07)	0.14 (0.10)	0.60 (0.18)			0.18 (0.13)	0.11 (0.11)	0.47 (0.17)		
Burbot	0.02 (0.01)					0.12 (0.08)				
White bass	4.07 (1.03)	0.86 (0.38)	6.70 (3.41)			5.11 (1.55)	1.00 (0.65)	5.41 (1.73)		
Rock bass	0.73 (0.20)	0.07 (0.07)	0.65 (0.33)			0.65 (0.27)		2.06 (0.84)		
Green sunfish	0.06 (0.04)		0.10 (0.10)			0.18 (0.18)				
Pumpkinseed	0.05 (0.03)		0.20 (0.12)							
Bluegill	4.97 (1.53)	0.50 (0.17)	15.45 (5.50)			0.71 (0.27)		2.18 (1.38)		
Green sunfish x bluegill	0.03 (0.03)		0.10 (0.10)							
Smallmouth bass	2.25 (0.43)	0.21 (0.15)	0.75 (0.32)			7.96 (1.80)	0.83 (0.44)	3.41 (1.51)		
Largemouth bass	3.57 (0.59)	1.43 (0.86)	8.10 (1.65)			2.33 (0.53)		2.29 (0.96)		
White crappie	0.14 (0.10)	0.07 (0.07)	0.05 (0.05)					0.47 (0.47)		
Black crappie	0.47 (0.12)	0.07 (0.07)	1.05 (0.39)			0.35 (0.15)	0.17 (0.17)	0.47 (0.15)		
Johnny darter	0.07 (0.04)		0.20 (0.12)			0.12 (0.12)				
Yellow perch	1.19 (0.26)	0.36 (0.17)	2.45 (0.71)			1.32 (1.00)		0.88 (0.27)		
Logperch	0.49 (0.14)		1.00 (0.43)			0.53 (0.26)		0.65 (0.36)		
River darter	0.02 (0.02)					0.12 (0.12)				
Sauger	0.84 (0.18)	0.14 (0.14)	1.25 (0.50)			1.00 (0.38)		1.41 (0.44)		
Walleye	0.80 (0.18)	0.57 (0.31)	1.25 (0.46)			0.60 (0.19)	0.23 (0.23)	0.76 (0.34)		
Sauger x walleye	0.02 (0.02)					0.06 (0.06)	0.11 (0.11)	0.06 (0.06)		
Freshwater drum	1.36 (0.46)	0.57 (0.36)	2.55 (1.43)			1.88 (1.25)	0.42 (0.42)	0.76 (0.26)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Silver lamprey	0.06 (0.06)		0.06 (0.06)							
Longnose gar	0.29 (0.17)		0.30 (0.17)							
Shortnose gar	0.12 (0.12)		0.12 (0.12)							
Bowfin	1.17 (0.32)		1.17 (0.32)							
Gizzard shad	7.43 (6.84)		7.48 (6.90)							
Common carp	2.26 (0.73)		2.28 (0.74)							
River carpsucker	0.17 (0.09)		0.17 (0.09)							
White sucker	0.22 (0.15)		0.23 (0.16)							
Smallmouth buffalo	0.11 (0.08)		0.12 (0.08)							
Spotted sucker	0.34 (0.20)		0.35 (0.20)							
Silver redhorse	6.12 (2.87)		6.16 (2.90)							
Shorthead redhorse	0.72 (0.41)		0.73 (0.42)							
Yellow bullhead	0.18 (0.13)		0.18 (0.13)							
Brown bullhead	0.06 (0.06)		0.06 (0.06)							
Northern pike	0.35 (0.14)		0.35 (0.14)				0.30 (0.30)			
White bass	2.08 (0.76)		2.09 (0.77)				0.24 (0.24)			
Rock bass	0.37 (0.21)		0.36 (0.22)				1.17 (0.82)			
Pumpkinseed	0.06 (0.06)		0.06 (0.06)							
Bluegill	10.59 (4.06)		10.67 (4.10)							
Smallmouth bass	0.05 (0.05)		0.06 (0.06)							
Largemouth bass	0.11 (0.07)		0.11 (0.07)							
White crappie	0.33 (0.18)		0.34 (0.18)							
Black crappie	16.22 (7.09)		16.33 (7.15)				1.50 (1.14)			
Yellow perch	0.97 (0.29)		0.98 (0.30)							
Walleye	0.06 (0.06)		0.06 (0.06)							
Freshwater drum	1.16 (0.35)		1.13 (0.35)				6.14 (3.22)			

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.07 (0.04)	0.07 (0.04)								
Shortnose gar	0.07 (0.04)	0.07 (0.04)								
Bowfin	0.64 (0.34)	0.64 (0.34)								
Mooneye	0.22 (0.09)	0.22 (0.09)								
Gizzard shad	2.54 (1.98)	2.54 (1.98)								
Common carp	1.53 (0.29)	1.53 (0.29)								
Silver chub	0.12 (0.10)	0.12 (0.10)								
Golden shiner	0.02 (0.02)	0.02 (0.02)								
River carpsucker	0.02 (0.02)	0.02 (0.02)								
Quillback	0.09 (0.04)	0.09 (0.04)								
White sucker	0.07 (0.04)	0.07 (0.04)								
Smallmouth buffalo	0.23 (0.15)	0.23 (0.15)								
Spotted sucker	0.05 (0.03)	0.05 (0.03)								
Silver redhorse	1.10 (0.38)	1.10 (0.38)								
Shorthead redhorse	0.21 (0.08)	0.21 (0.08)								
Yellow bullhead	0.03 (0.03)	0.03 (0.03)								
Brown bullhead	0.02 (0.02)	0.02 (0.02)								
Channel catfish	0.13 (0.09)	0.13 (0.09)								
Northern pike	0.31 (0.13)	0.31 (0.13)								
White bass	5.74 (1.37)	5.74 (1.38)								
Rock bass	0.64 (0.28)	0.64 (0.28)								
Bluegill	1.23 (0.73)	1.23 (0.73)								
Smallmouth bass	0.07 (0.07)	0.07 (0.07)								
Largemouth bass	0.02 (0.02)	0.02 (0.02)								
White crappie	0.28 (0.18)	0.28 (0.18)								
Black crappie	11.71 (2.61)	11.71 (2.62)								
Yellow perch	0.92 (0.41)	0.92 (0.41)								
Sauger	0.40 (0.10)	0.40 (0.10)								
Walleye	0.20 (0.06)	0.20 (0.06)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Freshwater drum	12.17 (2.96)	12.17 (2.97)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.09 (0.05)		0.22 (0.13)							
Bowfin	0.12 (0.05)		0.23 (0.10)			0.07 (0.07)				
Gizzard shad	1.96 (1.36)		0.90 (0.37)			0.21 (0.14)		4.78 (4.24)		
Spotfin shiner	1.47 (0.53)		0.44 (0.34)			2.32 (1.39)		2.22 (1.16)		
Common carp	0.29 (0.11)		0.44 (0.22)					0.31 (0.17)		
Silver chub	0.06 (0.06)					0.23 (0.23)				
Emerald shiner	56.07 (48.71)		5.00 (3.56)			203.20 (195.35)		10.12 (7.65)		
River shiner	0.40 (0.28)					1.62 (1.12)				
Spottail shiner	0.35 (0.14)		0.58 (0.29)					0.30 (0.24)		
Weed shiner	0.02 (0.02)							0.07 (0.07)		
Mimic shiner	0.36 (0.17)		0.11 (0.11)			0.79 (0.51)		0.36 (0.30)		
Pugnose minnow	0.27 (0.14)		0.63 (0.32)							
Bullhead minnow	0.96 (0.42)		0.72 (0.31)					2.05 (1.24)		
White sucker	0.02 (0.02)		0.05 (0.05)							
Spotted sucker	0.02 (0.02)							0.06 (0.06)		
Silver redhorse	0.29 (0.13)		0.47 (0.28)					0.27 (0.16)		
Shorthead redhorse	0.18 (0.12)		0.05 (0.05)					0.49 (0.38)		
Channel catfish	0.08 (0.04)					0.22 (0.15)		0.07 (0.07)		
Tadpole madtom	0.13 (0.11)		0.30 (0.25)							
Flathead catfish	0.04 (0.03)					0.07 (0.07)		0.07 (0.07)		
Northern pike	0.24 (0.13)		0.06 (0.06)			0.78 (0.50)		0.06 (0.06)		
Trout-perch	0.06 (0.05)					0.08 (0.08)		0.13 (0.13)		
White bass	0.94 (0.48)		0.74 (0.41)			0.48 (0.22)		1.57 (1.37)		
Rock bass	0.20 (0.06)		0.11 (0.08)			0.29 (0.15)		0.24 (0.11)		
Green sunfish	0.06 (0.04)					0.15 (0.15)		0.06 (0.06)		
Bluegill	6.57 (2.37)		13.83 (5.51)			1.19 (0.61)	0.29 (0.29)	1.11 (0.71)		
Smallmouth bass	0.14 (0.06)		0.16 (0.12)			0.19 (0.13)		0.06 (0.06)		
Largemouth bass	1.28 (0.87)		2.28 (1.95)			0.08 (0.08)		0.91 (0.78)		
White crappie	0.04 (0.03)		0.06 (0.06)					0.05 (0.05)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

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Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCEW	SCB	TRI	TWZ
Black crappie	0.99 (0.26)		1.43 (0.49)			0.62 (0.51)		0.70 (0.29)		
Mud darter	0.31 (0.21)		0.67 (0.49)			0.10 (0.10)				
Johnny darter	0.32 (0.17)		0.66 (0.40)					0.13 (0.09)		
Yellow perch	0.19 (0.11)		0.11 (0.07)			0.39 (0.39)		0.13 (0.13)		
Logperch	2.60 (2.04)		5.27 (4.76)			1.14 (0.74)		0.20 (0.20)		
River darter	0.07 (0.04)		0.05 (0.05)			0.11 (0.11)		0.05 (0.05)		
Sauger	0.07 (0.05)		0.11 (0.11)					0.06 (0.06)		
Freshwater drum	0.13 (0.05)		0.17 (0.09)					0.18 (0.10)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Bowfin	0.02 (0.02)	0.02 (0.02)								
Gizzard shad	1.50 (1.22)	1.50 (1.23)								
Spotfin shiner	0.13 (0.13)	0.13 (0.13)								
Common carp	0.19 (0.09)	0.19 (0.09)								
Silver chub	0.05 (0.03)	0.05 (0.03)								
Emerald shiner	0.14 (0.05)	0.14 (0.05)								
Spottail shiner	1.24 (0.96)	1.24 (0.97)								
Bullhead minnow	0.02 (0.02)	0.02 (0.02)								
Quillback	0.05 (0.05)	0.05 (0.05)								
Smallmouth buffalo	0.02 (0.02)	0.02 (0.02)								
Bigmouth buffalo	0.02 (0.02)	0.02 (0.02)								
Silver redhorse	0.09 (0.05)	0.09 (0.05)								
Shorthead redhorse	0.07 (0.07)	0.07 (0.07)								
Yellow bullhead	0.02 (0.02)	0.02 (0.02)								
Brown bullhead	0.02 (0.02)	0.02 (0.02)								
Tadpole madtom	0.16 (0.08)	0.16 (0.08)								
Northern pike	0.07 (0.05)	0.07 (0.05)								
White bass	0.65 (0.28)	0.65 (0.28)								
Rock bass	0.14 (0.10)	0.14 (0.10)								
Bluegill	1.63 (0.79)	1.63 (0.79)								
Smallmouth bass	0.11 (0.06)	0.11 (0.06)								
Largemouth bass	0.12 (0.06)	0.12 (0.06)								
White crappie	0.30 (0.13)	0.30 (0.13)								
Black crappie	1.18 (0.43)	1.18 (0.43)								
Johnny darter	0.11 (0.05)	0.11 (0.05)								
Logperch	0.23 (0.12)	0.23 (0.12)								
River darter	0.07 (0.04)	0.07 (0.04)								
Sauger	0.04 (0.04)	0.04 (0.04)								
Walleye	0.02 (0.02)	0.02 (0.02)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Freshwater drum	1.78 (0.70)	1.78 (0.70)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Common carp	0.68 (0.17)	0.34 (0.20)				1.15 (0.43)	0.32 (0.21)	0.91 (0.37)		
Silver chub	0.04 (0.02)					0.03 (0.03)		0.11 (0.08)		
White sucker	0.01 (0.01)							0.03 (0.03)		
Smallmouth buffalo	0.03 (0.02)					0.12 (0.10)				
Spotted sucker	0.02 (0.02)	0.04 (0.04)								
Silver redhorse	0.08 (0.07)	0.13 (0.13)				0.06 (0.06)				
Golden redhorse	0.01 (0.01)							0.03 (0.03)		
Shorthead redhorse	0.03 (0.02)					0.03 (0.03)		0.08 (0.08)		
Channel catfish	0.38 (0.11)	0.22 (0.15)				0.44 (0.19)	0.73 (0.51)	0.63 (0.22)		
Flathead catfish	0.02 (0.02)	0.04 (0.04)								
White bass	0.01 (0.01)					0.03 (0.03)				
Rock bass	0.09 (0.06)	0.08 (0.08)				0.16 (0.16)		0.05 (0.05)		
Bluegill	0.09 (0.09)	0.18 (0.18)								
Black crappie	0.11 (0.06)	0.22 (0.12)				0.03 (0.03)				
Yellow perch	0.09 (0.07)	0.18 (0.14)								
Freshwater drum	0.22 (0.07)	0.22 (0.12)				0.16 (0.08)	0.22 (0.22)	0.29 (0.13)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Mooneye	0.02 (0.02)					0.09 (0.09)				
Gizzard shad	0.01 (0.01)							0.03 (0.03)		
Common carp	1.13 (0.31)	1.17 (0.55)				1.05 (0.44)	0.27 (0.18)	1.12 (0.43)		
River carpsucker	0.04 (0.04)	0.09 (0.09)								
Smallmouth buffalo	1.00 (0.39)	0.95 (0.74)				1.75 (0.54)	0.09 (0.09)	0.53 (0.21)		
Silver redhorse	0.22 (0.08)	0.29 (0.15)				0.22 (0.15)		0.08 (0.05)		
Shorthead redhorse	0.06 (0.02)					0.03 (0.03)		0.19 (0.08)		
Channel catfish	0.42 (0.18)	0.51 (0.32)				0.31 (0.16)		0.37 (0.28)		
Flathead catfish	0.02 (0.01)							0.08 (0.04)		
Northern pike	0.06 (0.03)	0.10 (0.06)						0.03 (0.03)		
White bass	0.08 (0.04)	0.10 (0.06)				0.06 (0.06)	0.09 (0.09)	0.05 (0.04)		
Bluegill	0.10 (0.07)	0.19 (0.15)								
Black crappie	0.33 (0.15)	0.67 (0.30)								
Freshwater drum	0.26 (0.11)	0.16 (0.11)				0.64 (0.40)		0.13 (0.08)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.02 (0.02)							0.03 (0.03)		
Shortnose gar	0.02 (0.02)							0.03 (0.03)		
Gizzard shad	6.98 (4.19)					11.54 (9.05)		3.42 (2.51)		
Spotfin shiner	3.12 (1.00)					1.04 (0.54)		4.74 (1.73)		
Common carp	0.05 (0.04)							0.10 (0.07)		
Speckled chub	0.02 (0.02)							0.03 (0.03)		
Silver chub	0.14 (0.11)							0.26 (0.20)		
Emerald shiner	103.61 (51.57)					155.71 (100.89)		62.97 (48.21)		
River shiner	4.54 (1.08)					8.29 (2.18)		1.61 (0.90)		
Spottail shiner	3.21 (2.37)					0.75 (0.56)		5.13 (4.22)		
Mimic shiner	0.64 (0.24)					0.29 (0.11)		0.90 (0.41)		
Pugnose minnow	0.02 (0.02)					0.04 (0.04)				
Bullhead minnow	1.18 (0.52)					0.21 (0.15)		1.94 (0.92)		
Quillback	0.53 (0.23)					0.79 (0.39)		0.32 (0.29)		
White sucker	0.02 (0.02)							0.03 (0.03)		
Smallmouth buffalo	0.02 (0.02)							0.03 (0.03)		
Bigmouth buffalo	0.02 (0.02)							0.03 (0.03)		
Shorthead redhorse	0.25 (0.10)					0.21 (0.15)		0.29 (0.15)		
Northern pike	0.15 (0.06)					0.04 (0.04)		0.23 (0.11)		
Trout-perch	0.33 (0.26)					0.04 (0.04)		0.55 (0.46)		
White bass	0.82 (0.26)					1.00 (0.54)		0.68 (0.21)		
Rock bass	0.18 (0.08)					0.04 (0.04)		0.29 (0.15)		
Green sunfish	0.02 (0.02)							0.03 (0.03)		
Bluegill	1.29 (0.41)					1.08 (0.64)		1.45 (0.52)		
Smallmouth bass	0.67 (0.19)					0.63 (0.21)		0.71 (0.30)		
Largemouth bass	0.71 (0.29)					0.25 (0.14)		1.06 (0.51)		
White crappie	0.02 (0.02)					0.04 (0.04)				
Black crappie	0.16 (0.11)					0.04 (0.04)		0.26 (0.20)		
Western sand darter	0.16 (0.10)					0.29 (0.20)		0.06 (0.06)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Mud darter	0.02 (0.02)							0.03 (0.03)		
Johnny darter	0.65 (0.22)					0.17 (0.13)		1.03 (0.39)		
Yellow perch	0.07 (0.04)					0.04 (0.04)		0.10 (0.05)		
Logperch	0.62 (0.22)					0.21 (0.12)		0.94 (0.38)		
River darter	0.31 (0.22)							0.55 (0.39)		
Sauger	0.04 (0.03)							0.06 (0.04)		
Freshwater drum	0.09 (0.05)					0.08 (0.06)		0.10 (0.07)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by gill netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.19 (0.13)	0.19 (0.13)								
Bowfin	0.56 (0.40)	0.56 (0.40)								
Gizzard shad	0.30 (0.16)	0.30 (0.16)								
Common carp	6.03 (2.88)	6.03 (2.88)								
River carpsucker	0.09 (0.09)	0.09 (0.09)								
Quillback	0.53 (0.31)	0.53 (0.31)								
Smallmouth buffalo	1.06 (0.43)	1.06 (0.43)								
Silver redhorse	1.46 (0.59)	1.46 (0.59)								
River redhorse	0.08 (0.08)	0.08 (0.08)								
Golden redhorse	0.26 (0.13)	0.26 (0.13)								
Shorthead redhorse	0.18 (0.12)	0.18 (0.12)								
Channel catfish	1.35 (0.30)	1.35 (0.30)								
Flathead catfish	0.12 (0.12)	0.12 (0.12)								
Northern pike	0.82 (0.30)	0.82 (0.30)								
White bass	5.66 (3.22)	5.66 (3.23)								
White crappie	0.10 (0.10)	0.10 (0.10)								
Black crappie	0.43 (0.16)	0.43 (0.16)								
Walleye	0.91 (0.32)	0.91 (0.32)								
Freshwater drum	4.46 (3.15)	4.46 (3.15)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.3.10. Mean catch-per-unit-effort and (standard error) for fishes collected by anchored trammel netting in Pool 4 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Bowfin	0.17 (0.11)	0.17 (0.11)								
Common carp	2.71 (0.63)	2.71 (0.63)								
Smallmouth buffalo	0.27 (0.20)	0.27 (0.20)								
Bigmouth buffalo	2.37 (1.75)	2.37 (1.75)								
Silver redhorse	0.17 (0.11)	0.17 (0.11)								
Channel catfish	0.09 (0.09)	0.09 (0.09)								
Flathead catfish	0.59 (0.23)	0.59 (0.23)								
Northern pike	0.08 (0.08)	0.08 (0.08)								
Sauger	0.08 (0.08)	0.08 (0.08)								
Walleye	0.17 (0.11)	0.17 (0.11)								
Freshwater drum	0.08 (0.08)	0.08 (0.08)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Silver lamprey						0.17 (0.17)			
Gizzard shad						6.71 (4.13)			
Spotfin shiner						3.00 (2.80)			
Common carp						1.58 (0.52)			
Silver chub						1.17 (0.98)			
Emerald shiner						6.42 (3.64)			
River carpsucker						0.17 (0.17)			
Blue sucker						0.21 (0.21)			
Smallmouth buffalo						0.58 (0.42)			
River redhorse						0.17 (0.17)			
Shorthead redhorse						11.75 (6.47)			
Channel catfish						0.33 (0.21)			
Flathead catfish						0.17 (0.17)			
White bass						3.25 (1.63)			
Bluegill						1.00 (1.00)			
Smallmouth bass						1.17 (0.98)			
Largemouth bass						0.83 (0.83)			
Logperch						2.00 (1.81)			
Sauger						2.00 (1.81)			
Walleye						1.33 (0.49)			
Freshwater drum						2.54 (1.92)			

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar									0.18 (0.18)
Mooneye									0.09 (0.09)
American eel									0.18 (0.12)
Gizzard shad									49.64 (19.02)
Spotfin shiner									0.18 (0.12)
Common carp									6.55 (1.45)
Silver chub									0.09 (0.09)
Emerald shiner									71.82 (53.95)
Bullhead minnow									0.09 (0.09)
River carpsucker									0.09 (0.09)
Quillback									0.27 (0.27)
Smallmouth buffalo									1.18 (0.66)
Bigmouth buffalo									1.09 (0.58)
Golden redbhorse									0.27 (0.27)
Shorthead redbhorse									1.45 (0.99)
Channel catfish									0.27 (0.14)
Flathead catfish									1.09 (0.44)
Northern pike									0.55 (0.37)
Burbot									0.18 (0.12)
White bass									19.27 (6.29)
Rock bass									0.64 (0.54)
Green sunfish									2.00 (0.74)
Bluegill									4.27 (1.41)
Green sunfish x bluegill									0.18 (0.12)
Pumpkinseed x bluegill									0.18 (0.18)
Smallmouth bass									4.64 (0.93)
Largemouth bass									2.27 (0.85)
White crappie									1.18 (0.60)
Black crappie									3.36 (1.85)
Yellow perch									0.09 (0.09)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Logperch									0.45 (0.25)
Sauger									14.09 (4.61)
Walleye									11.00 (3.89)
Sauger x walleye									0.09 (0.09)
Freshwater drum									12.82 (6.15)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 4 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar						0.25 (0.25)			0.19 (0.19)
Shortnose gar									0.57 (0.57)
Gizzard shad									1.60 (1.38)
Common carp						5.48 (3.54)			0.56 (0.56)
Silver chub						0.33 (0.33)			0.39 (0.39)
Silver redhorse						0.25 (0.25)			0.15 (0.15)
Shorthead redhorse						1.60 (1.19)			0.20 (0.20)
Channel catfish						0.25 (0.25)			
Flathead catfish						1.01 (0.40)			0.15 (0.15)
Northern pike						1.09 (0.72)			
White bass						0.76 (0.76)			27.06 (17.51)
Bluegill						0.33 (0.33)			0.59 (0.40)
White crappie						0.33 (0.33)			0.19 (0.19)
Black crappie						17.56 (11.26)			23.56 (11.01)
Sauger						1.08 (0.41)			0.19 (0.19)
Walleye									0.20 (0.20)
Freshwater drum						23.90 (12.67)			13.76 (9.09)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 4 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar									0.19 (0.19)
Gizzard shad									23.98 (23.98)
Spotfin shiner						1.24 (1.24)			13.47 (13.23)
Speckled chub						0.23 (0.23)			11.38 (11.38)
Silver chub						0.81 (0.48)			2.81 (1.35)
Emerald shiner						0.50 (0.50)			22360.4 (16810.3)
River shiner						0.50 (0.50)			1.85 (1.85)
Mimic shiner									79.17 (79.17)
Bullhead minnow									0.62 (0.62)
Shorthead redhorse									0.19 (0.19)
Channel catfish.						0.23 (0.23)			0.20 (0.20)
Tadpole madtom						0.34 (0.34)			
Flathead catfish						0.73 (0.47)			
Northern pike						0.25 (0.25)			
White bass						0.23 (0.23)			6.77 (3.26)
Green sunfish									0.19 (0.19)
Bluegill						0.84 (0.50)			0.20 (0.20)
White crappie						0.25 (0.25)			0.19 (0.19)
Black crappie						5.41 (3.02)			0.74 (0.38)
Mud darter						0.23 (0.23)			
Sauger						0.25 (0.25)			
Freshwater drum						1.66 (1.10)			0.40 (0.25)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 4 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Common carp						1.25 (0.54)			9.92 (2.36)
Channel catfish						0.18 (0.11)			0.09 (0.09)
Flathead catfish									0.18 (0.12)
Black crappie						0.09 (0.09)			
Freshwater drum									0.36 (0.12)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 4 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shovelnose sturgeon									0.09 (0.09)
Common carp						2.66 (1.29)			23.55 (10.19)
Smallmouth buffalo						0.47 (0.37)			1.26 (0.86)
Channel catfish						0.09 (0.09)			1.34 (0.94)
Flathead catfish									0.39 (0.29)
White bass						0.09 (0.09)			
Black crappie						0.09 (0.09)			
Freshwater drum						0.09 (0.09)			0.97 (0.67)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 1.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in Pool 4 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shovelnose sturgeon									0.08 (0.08)
Gizzard shad									0.08 (0.08)
Speckled chub									0.67 (0.28)
Channel catfish									1.50 (0.45)
River darter									0.08 (0.08)
Freshwater drum									1.33 (0.74)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

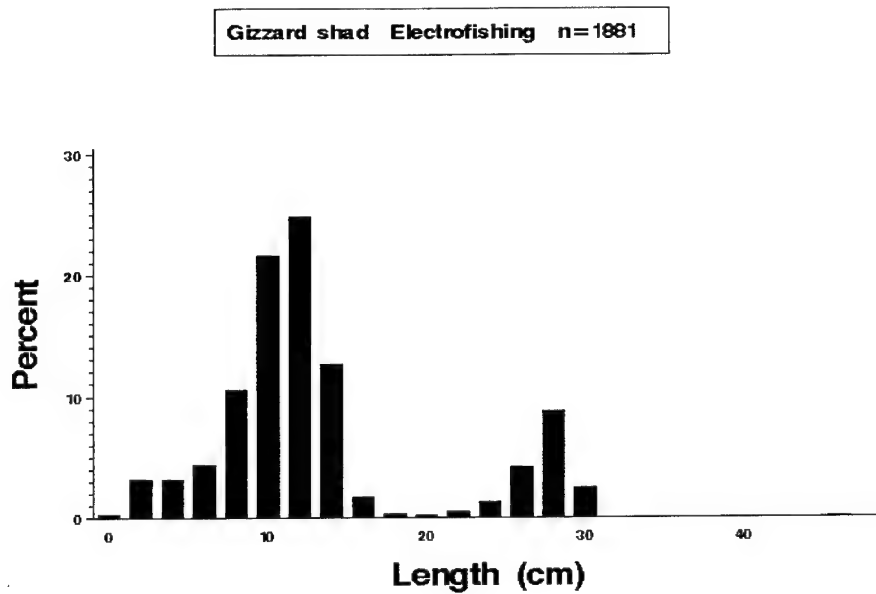


Figure 1.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

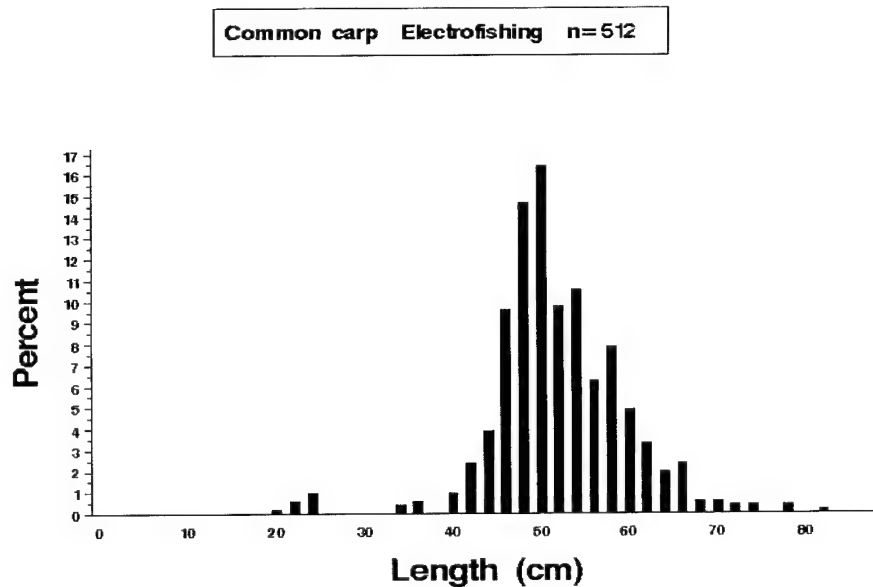


Figure 1.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

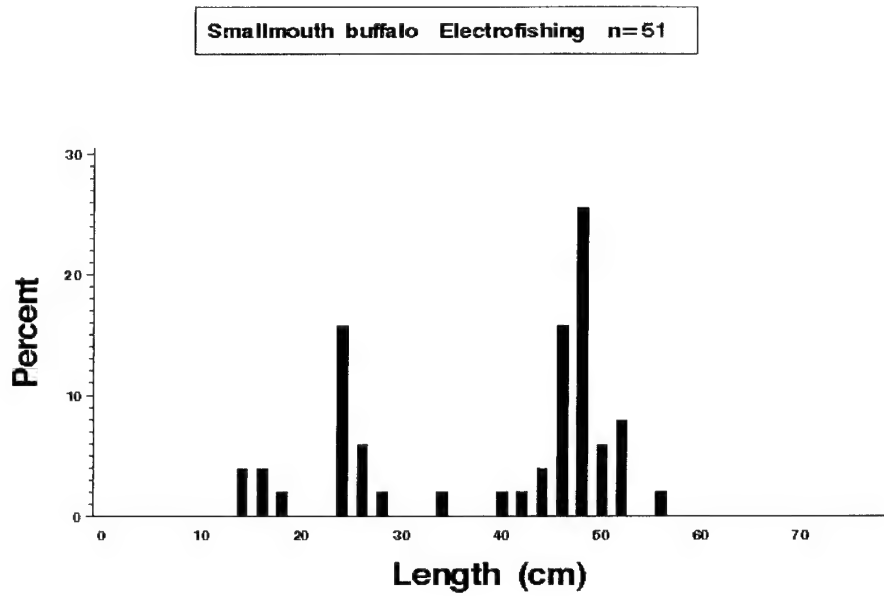


Figure 1.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

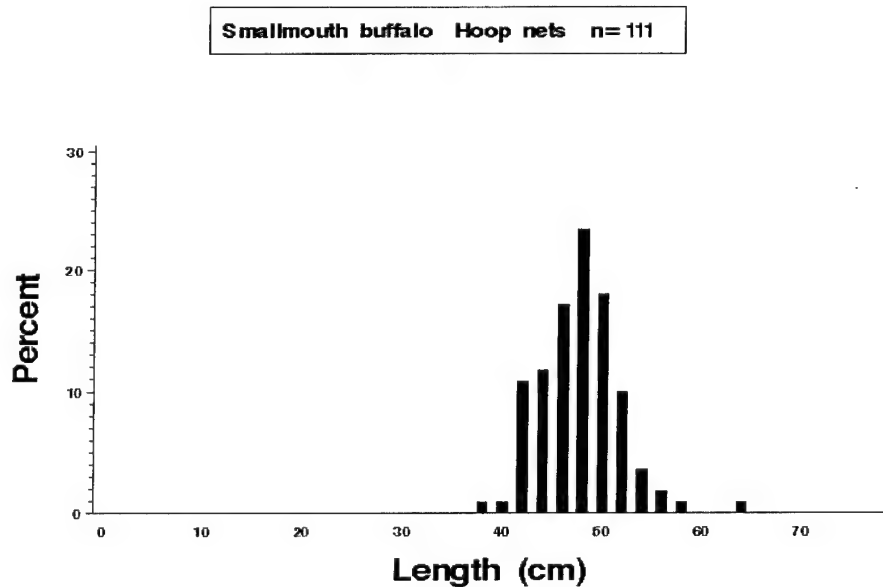


Figure 1.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by large and small hoop netting in Upper Mississippi River Pool 4 during 1995.

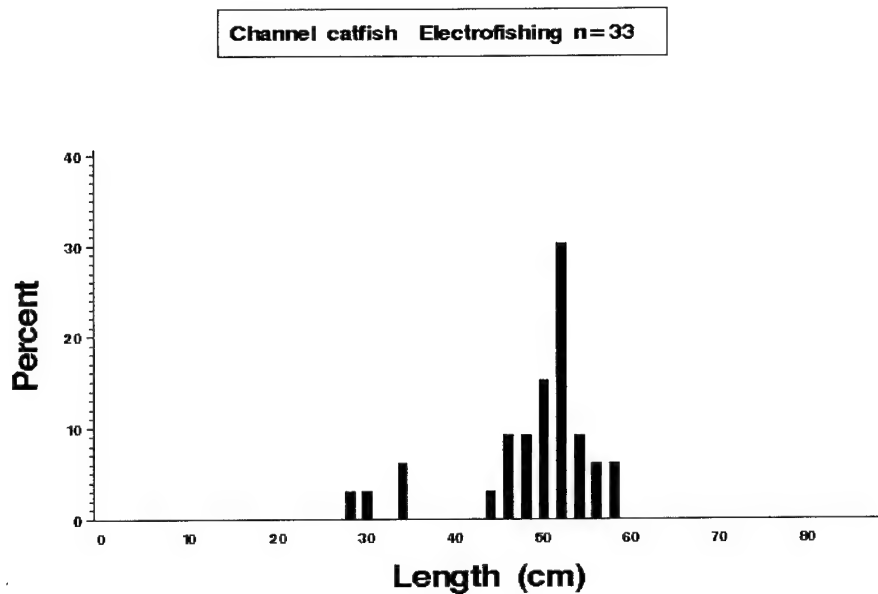


Figure 1.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

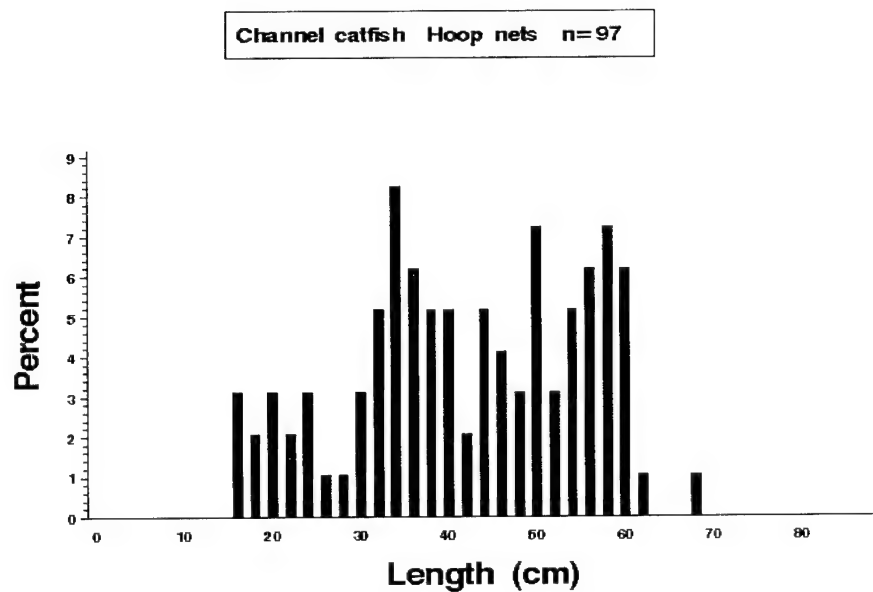


Figure 1.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by large and small hoop netting in Upper Mississippi River Pool 4 during 1995.

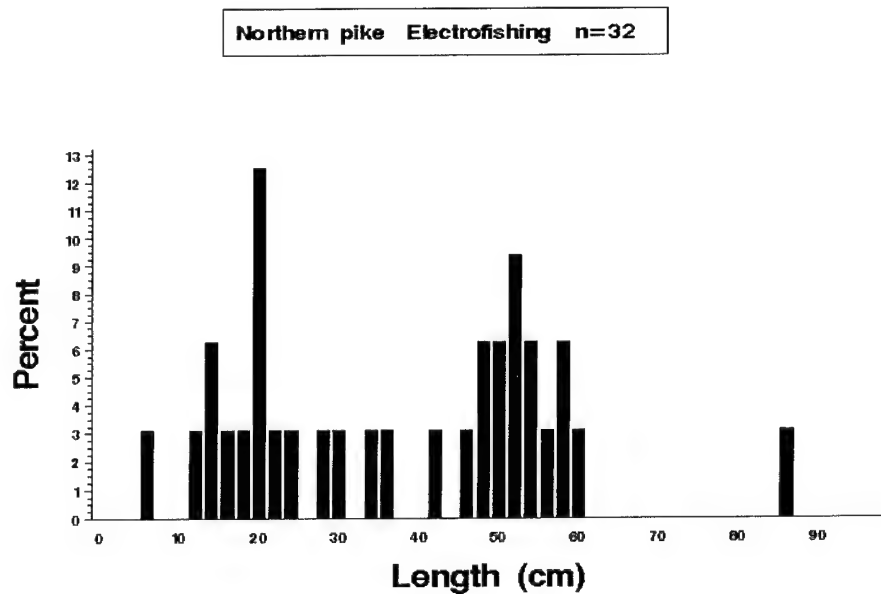


Figure 1.8. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

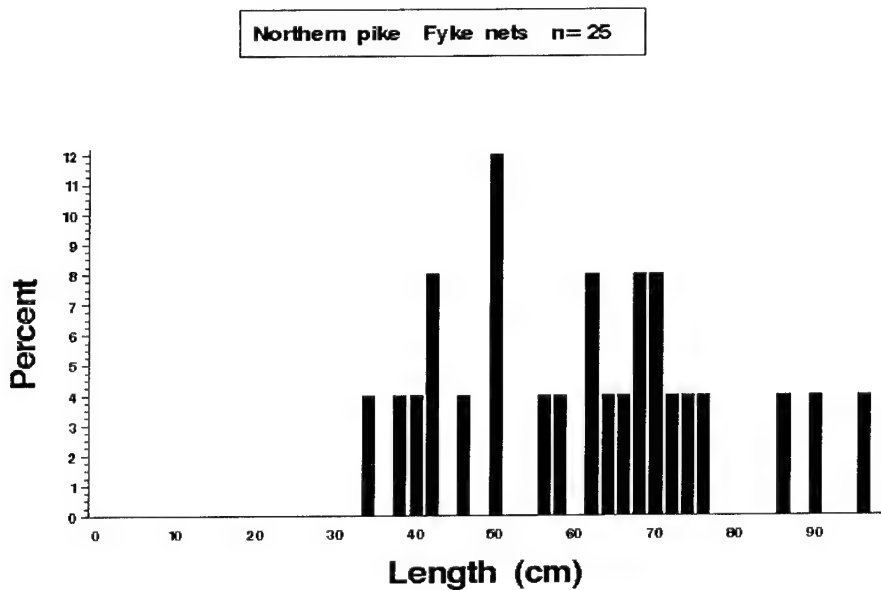


Figure 1.9. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 4 during 1995.

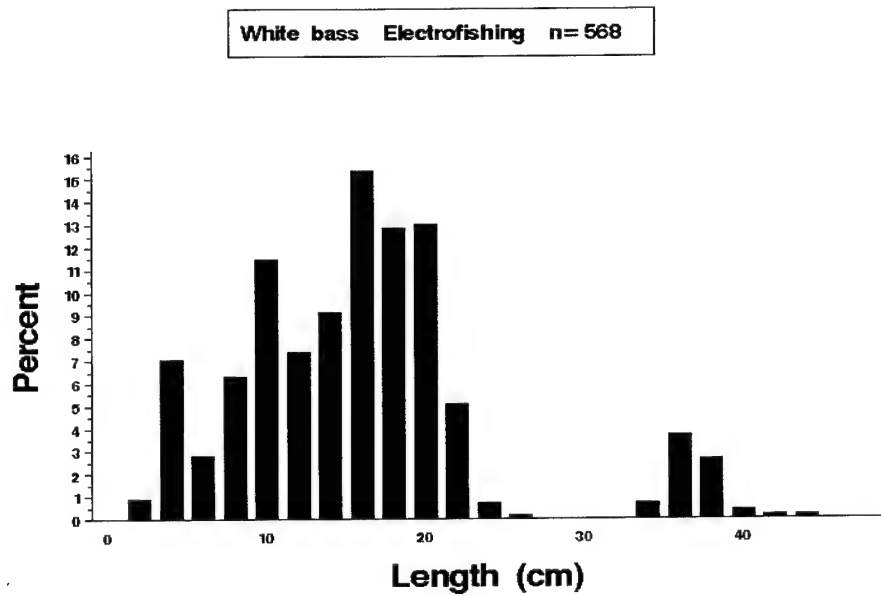


Figure 1.10. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

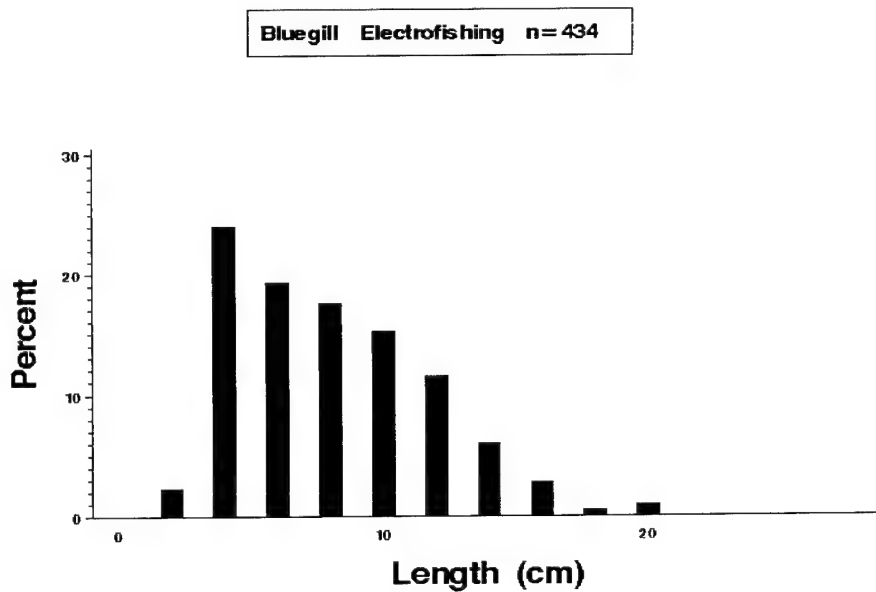


Figure 1.11. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

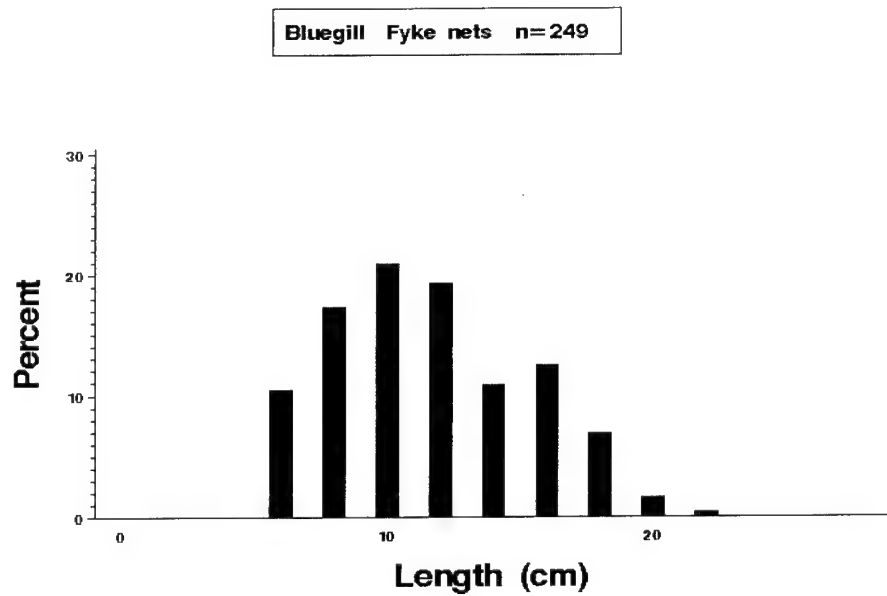


Figure 1.12. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 4 during 1995.

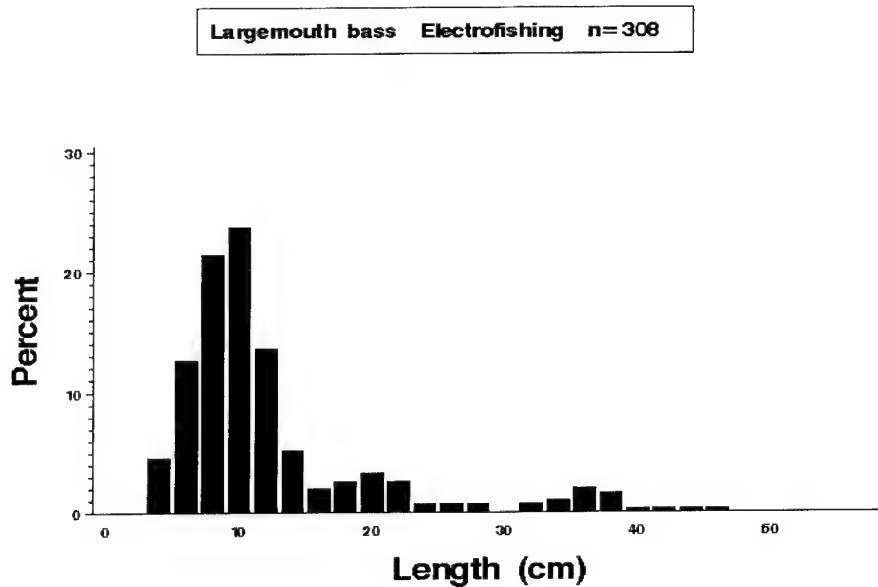


Figure 1.13. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

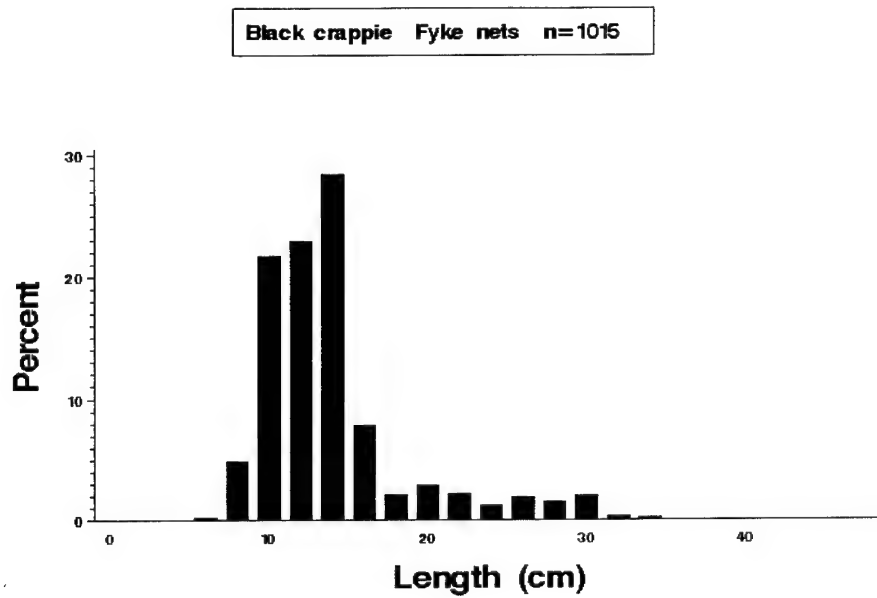


Figure 1.14. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

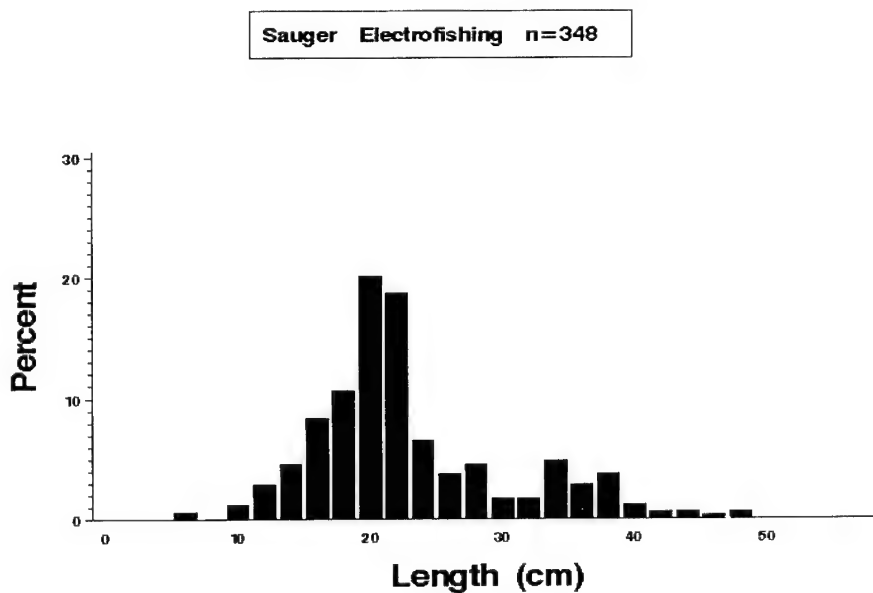


Figure 1.15. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

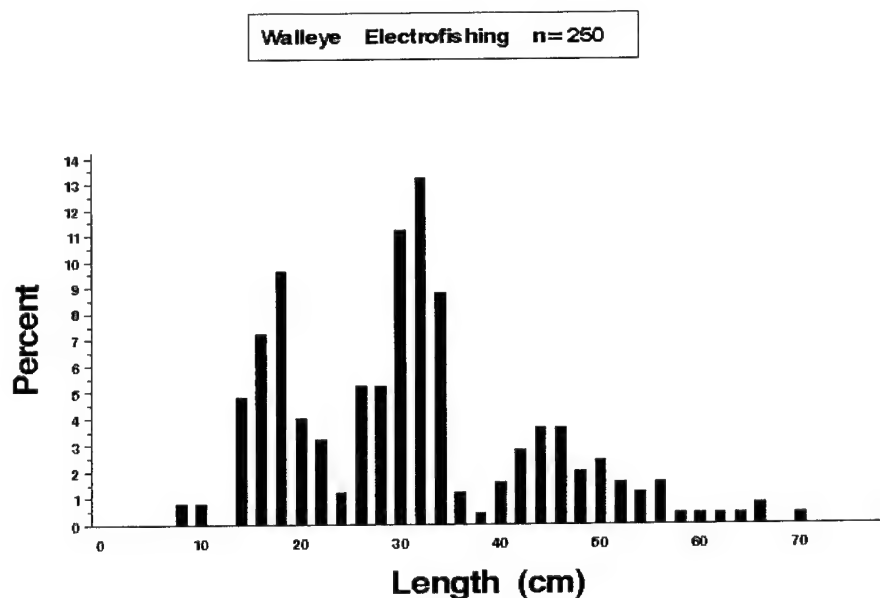


Figure 1.16. Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

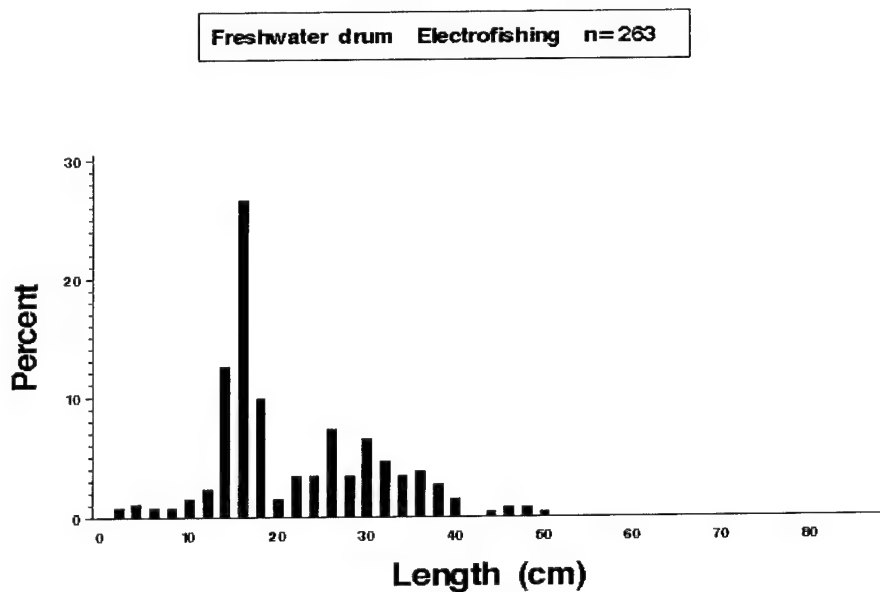


Figure 1.17. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 4 during 1995.

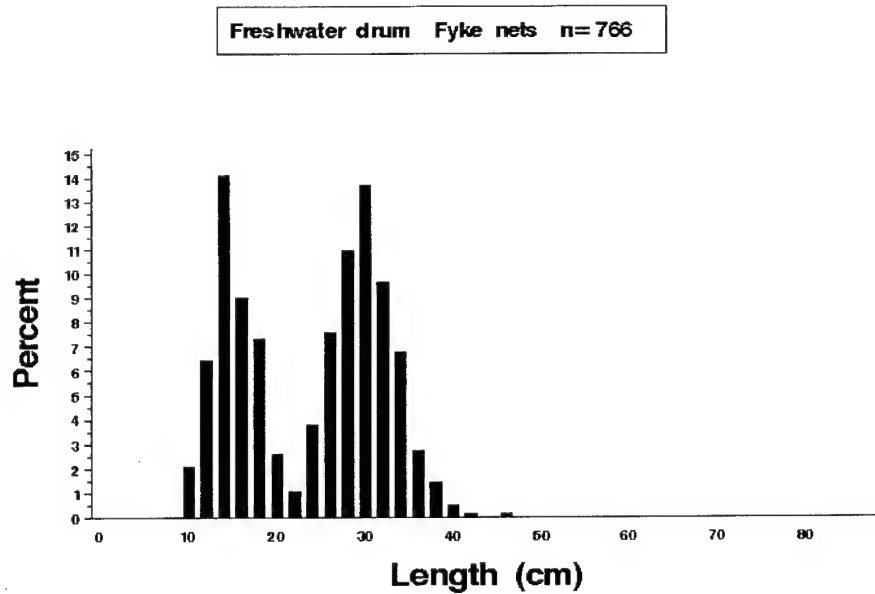


Figure 1.18. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 4 during 1995.

Chapter 2. Pool 8, Upper Mississippi River

by

Andrew Bartels and Eric Kramer

Wisconsin Department of Natural Resources
Onalaska Field Station
575 Lester Avenue
Onalaska, Wisconsin 54650

Hydrograph

The 1995 hydrograph for Pool 8 (Figure 2.1) indicated relatively normal water levels for the first half of the year and high water levels for the last half. The river did not reach flood stage in Pool 8 during 1995, but crested about 1 foot below the flood mark in late April. Stable water levels in late June and July were followed by surges in late August and October. The only uncommon feature of the 1995 hydrograph was the abrupt low water period between the two fall surges. Water levels did not negatively affect sampling activities in 1995. The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

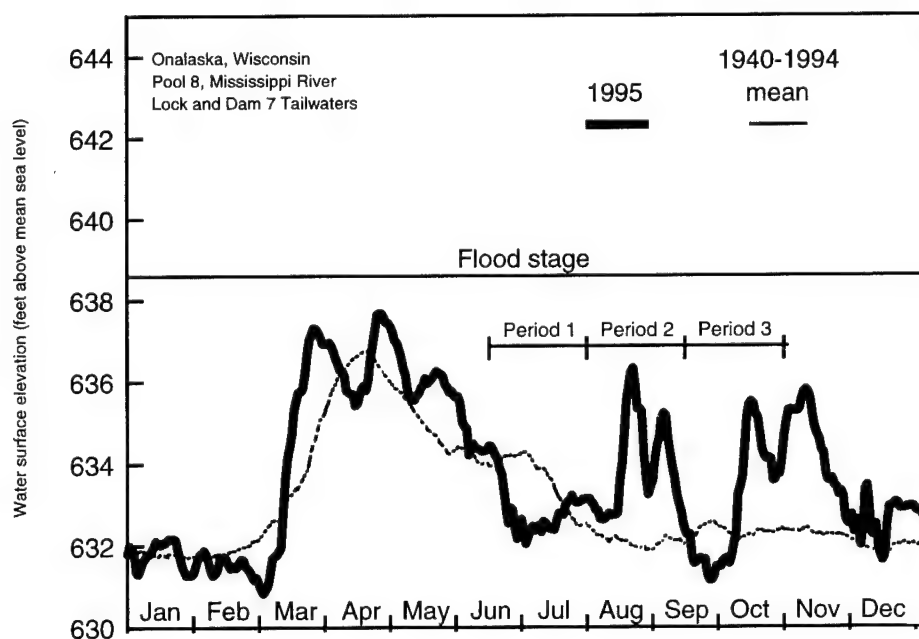


Figure 2.1. Daily water surface elevation from Lock and Dam 7 for Pool 8, Upper Mississippi River, during 1995 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

Summary of Sampling Effort

We made 546 fish collections in Pool 8 during 1995. Gear allocations across strata remained consistent for all three sampling periods at 182 collections per period, except that experimental trammel nets replaced gill nets after the middle of the second period (Table 2.1). The BWCS stratum received an extra day electrofishing run and an extra mini fyke net set when two designated SCB sites were misinterpreted as BWCS sites. Of the total number of collections, 456 were from randomly selected sites in the BWCO, BWCS, IMPO, IMPS, MCBU, MCBW, and SCB strata. Fifty-four collections were made at fixed TWZ sites, and 36 were from two fixed BWCS sites. The BWCS received the most sampling effort, followed by SCB and MCBU.

Total Catch by Gear

We collected 48,355 fish representing 72 species and 2 hybrid crosses in 1995 (Table 2.2). This total does not include 1,968 fish <30 mm long identified only to family or genus. The five most abundant species in our samples were emerald shiner (5,914), bluegill (5,704), bullhead minnow (4,991), spotfin shiner (4,327), and gizzard shad (3,460). Total species (excluding hybrids) collected, by gear type, were day electrofishing (57), night electrofishing (61), fyke netting (35), tandem fyke netting (29), mini fyke netting (47), tandem mini fyke netting (28), seining (41), small hoop netting (24), large hoop netting (23), gill netting (15), trammel netting (8), and trawling (8). Fish distribution records for the Upper Mississippi River (Pitlo et al. 1995) document 99 fish species from Pool 8. Our species total before the 1995 season was 87; one new species, lake sturgeon, was added in 1995, bringing the cumulative total to 88. In 1995, we caught one fish, which is on Wisconsin's endangered species list—a single goldeye. Also in 1995, we collected 4 blue suckers and 88 river redhorse, both listed as threatened in Wisconsin.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

For day electrofishing (Table 2.3.1), bluegill had the highest reachwide mean *C/f* (16.87), followed by gizzard shad (13.38) and spotfin shiner (10.92). Following are the fish species with the highest *C/f* within each stratum: BWCS (bluegill, 33.12), IMPS (gizzard shad, 28.67), MCBU (river shiner, 12.25), MCBW (shorthead redhorse, 8.91), and SCB (spotfin shiner, 20.35).

Night Electrofishing

For night electrofishing (Table 2.3.2), gizzard shad (17.48), freshwater drum (16.24), and bluegill (15.16) had the highest reachwide mean *C/f*s. Following are the fish species with the highest *C/f* within each stratum: BWCS (gizzard shad, 30.67), MCBU (river shiner, 31.00), MCBW (shorthead redhorse, 15.11), and SCB (freshwater drum, 17.83).

Fyke Net

Reachwide mean *C/f*s for fyke netting (Table 2.3.3) were highest for bluegill (20.52), black crappie (15.05), and gizzard shad (8.44). The fish species with the highest *C/f* within each stratum were BWCS (bluegill, 23.24) and IMPS (white bass, 10.71).

Tandem Fyke Net

Reachwide mean *C/f*s for tandem fyke netting (Table 2.3.4) were highest for freshwater drum (6.54), followed by bluegill (5.21) and white bass (3.97). These species had the highest *C/f* within each stratum: BWCO (bluegill, 42.20) and IMPO (freshwater drum, 7.12).

Mini Fyke Net

Bullhead minnow (57.18) had the highest reachwide mean *C/f* for mini fyke nets (Table 2.3.5), followed by emerald shiner (29.62) and spotfin shiner (22.24). Bullhead minnow (150.05) also dominated BWCS *C/f* for mini fyke nets. River shiner (52.04) was most abundant for mini fyke nets in the IMPS stratum. Spotfin shiner had the highest *C/f* in both MCBU (8.68) and MCBW (9.64) strata, and largemouth bass (52.44) had the highest *C/f* for the SCB stratum.

Tandem Mini Fyke Net

Bluegill (8.69) had the highest reachwide mean *C/f* for tandem mini fyke netting (Table 2.3.6), followed by spottail shiner (1.49) and freshwater drum (1.47). Bluegill had the highest mean *C/f* in the BWCO (68.08), and spottail shiner (1.70) was the highest in the IMPO stratum.

Small Hoop Net

For small hoop nets (Table 2.3.7), channel catfish had the highest reachwide mean *C/f* (2.68) and the highest *C/f* for each stratum: BWCO (3.00), IMPO (3.05), MCBU (2.38), MCBW (2.81), and SCB (1.49). The next highest reachwide mean *C/f*s were held by shorthead redhorse (0.72) and freshwater drum (0.48).

Large Hoop Net

For large hoop nets (Table 2.3.8), common carp had the highest reachwide mean *C/f* (1.43), followed by channel catfish (1.04) and silver redhorse (0.77). Common carp had the highest stratumwide *C/f* for large hoop nets in the following aquatic areas: BWCO (1.01), IMPO (1.81), and MCBU (0.87). In the MCBW stratum, smallmouth buffalo (1.04) had the highest mean *C/f*, and in the SCB stratum, channel catfish (1.41) had the highest mean *C/f*.

Seine

Spotfin shiner (30.58) had the highest reachwide mean *C/f* for seining (Table 2.3.9), followed by emerald shiner (27.62) and river shiner (25.28). Following are the fish species with the highest *C/f* within each stratum: BWCS (river shiner 28.83), MCBU (emerald shiner, 48.88), and SCB (spotfin shiner, 47.25).

Gill Net

Silver redhorse (1.61) had the highest reachwide mean *C/f* for gill nets (Table 2.3.10). Common carp (1.28) and freshwater drum (1.10) had the next highest reachwide catch rates. These nets were only set in the IMPO stratum, so the same values and ranks apply to the stratum means. Common carp (*C/f* = 0.19) was the only fish collected in IMPO trammel nets (Table 2.3.11).

Fixed Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

For day electrofishing in 1995 at the two BWCS fixed sites in Pool 8, gizzard shad (16.73) had the highest mean *C/f* (Table 2.4.1), followed by bluegill (11.32) and largemouth bass (8.89).

Night Electrofishing

Night electrofishing, conducted at four TWZ fixed sites in 1995 (Table 2.4.2), yielded white bass (*C/f* = 45.91) in greatest abundance. The next highest mean *C/fs* for TWZ night electrofishing were for sauger (34.07) and freshwater drum (21.21).

Fyke Net

The BWCS fyke nets at fixed sites (Table 2.4.3) produced the following catch rates: bluegill (54.61), black crappie (28.63), and yellow perch (2.76).

Mini Fyke Net

For mini fyke netting at four TWZ fixed sites (Table 2.4.4), emerald shiner (33.95), spottail shiner (28.09), and channel shiner (24.39) had the highest mean *C/fs*.

Small Hoop Net

Freshwater drum had the highest mean *C/f* (2.52) for small hoop nets (Table 2.4.5) in the TWZ stratum (Table 2.4.6). Freshwater drum was followed by channel catfish (2.27) and common carp (1.23).

Large Hoop Net

Freshwater drum had the highest mean *C/f* (2.60) for large hoop nets in the TWZ stratum (Table 2.4.6). Freshwater drum was followed by common carp (2.03) and smallmouth buffalo (1.67).

Seine

For fixed-site BWCS seining (Table 2.4.7), spotfin shiner (mean *C/f* = 12.83) was most abundant, followed by largemouth bass (9.25) and bullhead minnow (8.00). For TWZ fixed sites, emerald shiner (46.75) had the highest *C/f*. River shiner (10.75), gizzard shad (9.17), and spotfin shiner (9.17) had similar mean *C/fs*.

Trawl

Freshwater drum (6.33) had the highest mean *C/f* in the TWZ trawls (Table 2.4.8), followed by channel catfish (0.75) and sauger (0.58).

Length Distributions of Selected Species

Length distributions are presented for selected species in Figures 2.2 to 2.19. The length distributions presented may be limited by the size selectiveness of the particular gear. Care should be used when trying to interpret length distributions from samples <100 (Anderson and Neumann 1996); they are presented in this report because of local interest in the species by river managers.

Gizzard Shad

Most gizzard shad collected by electrofishing in Pool 8 during 1995 were less than 150 mm long (Figure 2.2). Sample size was 2,229 fish. Although few gizzard shad were longer than 140 mm, we collected one fish that was about 420 mm long.

Common Carp

The electrofishing length distribution from 701 common carp (Figure 2.3) showed a large group of fish from 420 to 640 mm long with relatively few fish outside this range. There were few common carp less than 400 mm long. Given the abundance of adults, this paucity of juveniles is puzzling.

Smallmouth Buffalo

Smallmouth buffalo collected by electrofishing showed a very different picture than those collected by hoop nets. The 86 smallmouth buffalo collected by electrofishing (Figure 2.4) ranged mostly from 100 to 300 mm long. Very few large adults were collected, although we did catch two fish greater than 600 mm long. We collected 109 smallmouth buffalo in tandem hoop net sets (Figure 2.5) in 1995. Most smallmouth buffalo collected in hoop nets were nearly 300 mm long or longer, with a substantial number more than 500 mm long.

Channel Catfish

The sample size of 52 channel catfish caught by electrofishing was too small to define the size structure for channel catfish in Pool 8 (Figure 2.6). Most of those catfish were between 300 and 600 mm long. The length distribution of 457 channel catfish collected in hoop nets in 1995 (Figure 2.7) showed a large group of fish from 300 to 400 mm long and an even distribution around that group. Some large catfish as long as 700 mm were present in both gear types.

Northern Pike

The 1995 northern pike length distribution, represented as 64 fish collected by electrofishing (Figure 2.8), indicated nearly equal representation from all lengths up to 1 m long. The most abundant size class was the 500–600-mm-long group. The length distribution for 52 northern pike caught by fyke netting (Figure 2.9) shows a smaller range of lengths, from 360 to 940 mm long, again with the largest percentage around 600 mm long.

White Bass

The most abundant size of 1,327 white bass we collected with electrofishing in 1995 (Figure 2.10) was 140 mm long. A smaller group around 220 mm long was also present. The complete size range for white bass extended from 40 to 400 mm long.

Bluegill

We caught 1,864 bluegills during electrofishing in 1995 (Figure 2.11). The electrofishing distribution was skewed toward small fish, represented primarily by bluegills less than 100 mm long. The 2,061 bluegills collected in fyke nets (Figure 2.12) averaged much larger than those from electrofishing. Still, the largest group of fish was between 80 and 120 mm long. The number of quality-sized fish (>150 mm long; Anderson 1978) was quite low.

Largemouth Bass

The electrofishing length distribution from 722 largemouth bass (Figure 2.13), similar to that for bluegill, was skewed toward small fish. Those 100 mm long or less made up about 50% of the catch, while those longer than 300 mm made up only about 8% of the catch.

White Crappie

The sample size for white crappie, collected in fyke nets, was 31 fish. The length distribution for white crappie (Figure 2.14) showed an even distribution of medium and large fish, but no juveniles. This fish is not abundant in Pool 8, so the lack of juveniles in the sample is not surprising, and should not be interpreted as an indication that the population is endangered.

Black Crappie

We caught 1,252 black crappie in fyke nets in 1995 (Figure 2.15). Most of the fish collected were from 100 to 140 mm long. Although a small peak occurred at 220 mm long, we caught few black crappies more than 300 mm long.

Sauger

The sample size for sauger caught by electrofishing in 1995 was 933 (Figure 2.16). The distribution was nearly bell-shaped and centered around a range of 140 to 280 mm long.

Walleye

We caught 475 walleyes in 1995 by electrofishing. Similar to the sauger distribution, the length distribution for walleye was rather bell-shaped, but with a longer right-hand tail (Figure 2.17). The majority of the catch was from 180 to 340 mm long.

Freshwater Drum

The length distribution for freshwater drum collected by electrofishing represents 1,255 fish (Figure 2.18). The majority of freshwater drum in the electrofishing catch during 1995 were less than 220 mm long. A similar picture was indicated by 284 freshwater drum collected in fyke nets (Figure 2.19). About 15% of the electrofishing catch was evenly distributed from 240 to 540 mm long; about 10% were longer than 300 mm in the fyke net catch.

Table 2.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in Pool 8 of the Mississippi River during 1995. Table entries are numbers of successfully completed standardized monitoring collections.

Table page: 1

Sampling period = 1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		8	4	4	4				32
Fyke net	16					4				20
Gill net							4			4
Large hoop net		4	4	4	4		4		2	22
Small hoop net		4	4	4	4		4		2	22
Mini fyke net	8		6	4	4	4			2	28
Night electrofishing	2		4	4	4				4	18
Seine	8		4	8					4	24
Trawling									4	4
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
	----	----	----	----	----	----	----	----	----	----
SUBTOTAL	46	12	30	28	20	12	16	0	18	182

Sampling period = 2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		8	4	4	4				32
Fyke net	16					4				20
Gill net							3			3
Large hoop net		4	4	4	4		4		2	22
Small hoop net		4	4	4	4		4		2	22
Mini fyke net	8		6	4	4	4			2	28
Night electrofishing	2		4	4	4				4	18
Seine	8		4	8					4	24
Trawling									4	4
Trammel net (set)							1			1
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
	----	----	----	----	----	----	----	----	----	----
SUBTOTAL	46	12	30	28	20	12	16	0	18	182

Sampling period = 3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	13		7	4	4	4				32
Fyke net	16					4				20
Large hoop net		4	4	4	4		4		2	22
Small hoop net		4	4	4	4		4		2	22
Mini fyke net	9		5	4	4	4			2	28
Night electrofishing	2		4	4	4				4	18
Seine	8		4	8					4	24
Trawling									4	4
Trammel net (set)							4			4
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
	----	----	----	----	----	----	----	----	----	----
SUBTOTAL	48	12	28	28	20	12	16	0	18	182
	====	====	====	====	====	====	====	====	====	====
	140	36	88	84	60	36	48	0	54	546

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SBU - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 8 of the Mississippi River. See Table 2.1 for the list of sampling gears actually deployed in this study reach.

Table page: 1

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	6	3	-	-	-	-	-	-	-	-	-	-	9
2	Silver lamprey	Ichthyomyzon unicuspis	6	8	1	-	1	-	-	1	3	-	-	-	20
3	American brook lamprey	Lampetra appendix	-	1	-	-	-	-	-	-	-	-	-	-	1
4	Lake sturgeon	Acipenser fulvescens	-	-	-	-	-	-	-	-	-	-	-	1	1
5	Shovelnose sturgeon	Scaphirhynchus platyrhynchus	-	-	-	-	-	-	-	-	-	-	-	5	5
6	Longnose gar	Lepisosteus osseus	29	26	29	6	14	-	-	1	2	3	-	-	110
7	Shortnose gar	Lepisosteus platostomus	9	17	128	30	31	2	-	1	4	-	-	-	222
8	Bowfin	Amia calva	18	12	96	10	4	1	-	3	10	6	-	-	160
9	Goideye	Hiodon alosoides	1	-	-	-	-	-	-	-	-	-	-	-	1
10	Mooneye	Hiodon tergisus	8	63	2	1	-	-	-	-	-	7	-	-	81
11	Gizzard shad	Dorosoma cepedianum	1418	811	354	30	95	9	739	1	3	-	-	-	3460
12	Spotfin shiner	Cyprinella spiloptera	779	281	-	-	1791	-	1476	-	-	-	-	-	4327
13	Common carp	Cyprinus carpio	480	221	83	17	48	6	15	36	136	9	1	2	1054
14	Mississippi silvery minnow	Hybognathus nuchalis	-	8	-	-	1	-	2	-	-	-	-	-	11
15	Silver chub	Macrhybopsis storeriana	1	9	-	-	-	-	-	12	-	-	-	3	25
16	Golden shiner	Notemigonus crysoleucas	49	1	3	1	22	2	3	-	-	-	-	-	81
17	Emerald shiner	Notropis atherinoides	393	648	-	-	2631	6	2236	-	-	-	-	-	5914
18	River shiner	Notropis biennioides	223	469	-	-	1014	2	1229	-	-	-	-	-	2937
19	Spottail shiner	Notropis hudsonius	43	36	-	-	273	21	88	-	-	-	-	-	461
20	Sand shiner	Notropis stramineus	-	3	-	-	1	-	2	-	-	-	-	-	6
21	Weed shiner	Notropis texanus	-	-	-	-	2	-	-	-	-	-	-	-	2
22	Mimic shiner	Notropis volucellus	-	2	-	-	-	-	-	-	-	-	-	-	2
23	Channel shiner	Notropis wickliffi	22	440	-	-	288	4	215	-	-	-	-	-	969
24	Pugnose minnow	Opsopoeodus emiliae	51	28	-	-	654	94	106	-	-	-	-	-	933
25	Bluntnose minnow	Pimephales notatus	-	-	-	-	1	-	-	-	-	-	-	-	1
26	Fathead minnow	Pimephales promelas	-	49	-	-	1	-	-	-	-	-	-	-	50
27	Bullhead minnow	Pimephales vigilax	286	145	-	-	4071	12	477	-	-	-	-	-	4991
28	Unidentified minnow	Unidentified Cyprinidae	-	104	-	-	1	-	10	-	-	-	-	-	115
29	River carpsucker	Carpiodes carpio	5	23	-	-	-	-	1	-	-	1	-	-	30
30	Quillback	Carpiodes cyprinus	126	163	5	-	36	2	610	-	-	-	-	-	942
31	Highfin carpsucker	Carpiodes velifer	-	2	-	-	-	-	-	-	-	-	-	-	2
32	Unidentified carpsucker	Carpiodes sp.	-	2	-	-	14	-	1337	-	-	-	-	-	1353
33	White sucker	Catostomus commersoni	1	1	1	-	-	-	-	-	-	-	-	-	3
34	Blue sucker	Cypleptus elongatus	1	3	-	-	-	-	-	-	-	-	-	-	4
35	Northern hog sucker	Hypentelium nigricans	-	1	-	-	-	-	-	-	-	-	-	-	1
36	Smallmouth buffalo	Ictiobus bubalus	44	42	12	9	-	-	-	-	5	104	-	-	217
37	Bigmouth buffalo	Ictiobus cyprinellus	7	7	-	-	-	-	1	-	-	-	-	-	15
38	Spotted sucker	Minytrema melanops	144	36	33	3	3	-	8	2	2	-	-	-	231
39	Silver redhorse	Moxostoma anisurum	193	171	121	31	13	-	17	7	55	11	-	-	619

Gears: D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 2.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 8 of the Mississippi River. See Table 2.1 for the list of sampling gears actually deployed in this study reach.

Table page: 2

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T TOTAL
40	River redhorse	Moxostoma carinatum	30	56	1	-	-	-	1	-	-	-	-	88
41	Golden redhorse	Moxostoma erythrum	99	110	7	1	-	1	3	2	1	-	-	224
42	Shorthead redhorse	Moxostoma macrolepidotum	559	834	50	39	55	3	23	83	70	2	-	1723
43	Unidentified redhorse	Moxostoma sp.	16	-	-	-	11	-	24	-	-	-	-	51
44	Unidentified sucker	Unidentified Catostomidae	-	-	-	-	4	-	125	-	-	-	-	129
45	Black bullhead	Ameiurus melas	-	-	-	-	1	-	-	-	1	-	-	5
46	Brown bullhead	Ameiurus nebulosus	-	-	-	-	1	-	-	-	1	-	-	2
47	Channel catfish	Ictalurus punctatus	21	31	11	6	5	6	-	338	119	4	-	9 550
48	Tadpole madtom	Noturus gyrinus	1	1	-	-	7	1	-	-	-	-	-	10
49	Flathead catfish	Pylodictis olivaris	10	31	13	4	-	-	-	4	25	1	-	88
50	Northern pike	Esox lucius	37	27	43	9	2	-	2	-	7	2	-	129
51	Central mudminnow	Umbra limi	-	-	-	-	1	-	-	-	-	-	-	1
52	Trout-perch	Percopsis omiscomaycus	-	1	-	-	-	-	1	-	-	-	-	2
53	Burbot	Lota lota	5	18	-	-	-	-	-	-	-	-	-	23
54	Brook silverside	Labidesthes sicculus	23	32	-	-	41	-	102	-	-	-	-	198
55	White bass	Morone chrysops	193	1134	224	62	114	22	60	3	11	1	-	1824
56	Yellow bass	Morone mississippiensis	1	1	-	-	-	-	-	-	-	-	-	2
57	Rock bass	Ambloplites rupestris	188	170	20	1	14	-	1	11	-	-	-	405
58	Green sunfish	Lepomis cyanellus	42	10	1	-	12	-	-	-	-	-	-	65
59	Pumpkinseed	Lepomis gibbosus	15	7	16	2	17	-	-	-	-	-	-	57
60	Warmouth	Lepomis gulosus	3	-	-	1	5	-	-	2	-	-	-	11
61	Orangespotted sunfish	Lepomis humilis	72	21	1	-	188	75	22	-	-	-	-	379
62	Bluegill	Lepomis macrochirus	1334	530	1539	522	809	826	117	24	3	-	-	5704
63	Green sunfish x pumpkinseed	L. cyanellus x L. gibbosus	1	-	-	-	-	-	-	-	-	-	-	1
64	Green sunfish x bluegill	L. cyanellus x L. macrochirus	1	-	2	-	-	-	-	-	-	-	-	3
65	Unidentified Lepomis	Lepomis sp.	-	-	-	-	-	-	-	-	-	-	-	1
66	Smallmouth bass	Micropterus dolomieu	293	542	-	2	14	-	17	1	3	1	-	873
67	Largemouth bass	Micropterus salmoides	519	203	25	1	1027	1	248	-	-	-	-	2024
68	White crappie	Pomoxis annularis	3	-	22	9	13	4	-	4	1	-	-	56
69	Black crappie	Pomoxis nigromaculatus	112	110	1011	241	83	22	3	27	32	-	-	1641
70	Unidentified sunfish	Unidentified Centrarchidae	-	-	-	-	-	-	183	-	-	-	-	319
71	Western sand darter	Ammocrypta clara	4	2	-	-	-	-	73	-	-	-	-	79
72	Mud darter	Etheostoma asprigene	6	5	-	-	30	-	5	-	-	-	-	46
73	Johnny darter	Etheostoma nigrum	64	4	-	-	87	4	96	-	-	-	-	255
74	Yellow perch	Perca flavescens	70	86	67	17	4	2	18	3	-	-	-	267
75	Logperch	Percina caprodes	119	43	-	-	56	6	35	-	-	-	-	259
76	Slenderhead darter	Percina phoxocephala	5	10	-	-	37	2	4	-	-	-	-	58
77	River darter	Percina shumardi	1	-	-	-	-	-	9	-	-	-	-	10
78	Sauger	Stizostedion canadense	63	870	50	7	2	-	4	-	-	1	-	7 1004

Gears: D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
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Table 2.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 8 of the Mississippi River. See Table 2.1 for the list of sampling gears actually deployed in this study reach. Table page:

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T TOTAL
79	Walleye	Stizostedion vitreum	35	440	13	2	2	2	12	1	1	1	-	509
80	Freshwater drum	Aplodinotus grunniens	226	1029	165	120	57	26	2	88	85	8	-	1882
			=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
			8514	10194	4152	1190	13839	1165	9763	660	679	58	1	108 50323

Gears: D - Day electrofishing
 N - Night electrofishing
 F - Fyke netting
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 Y - Tandem mini fyke netting

S - Seining
 HS - Small hoop netting
 HL - Large hoop netting
 G - Gill netting
 TA - Trammel netting, anchored sets
 T - Trawling (4.8-m bottom trawl)

Table 2.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Chestnut lamprey	0.10 (0.05)		0.08 (0.06)			0.17 (0.17)		0.09 (0.06)		
Silver lamprey	0.08 (0.03)		0.12 (0.07)		0.08 (0.08)			0.09 (0.06)		
Longnose gar	0.21 (0.05)		0.20 (0.08)		0.08 (0.08)	0.08 (0.08)	0.63 (0.46)	0.30 (0.10)		
Shortnose gar	0.10 (0.04)		0.20 (0.12)		0.25 (0.18)	0.08 (0.08)				
Bowfin	0.24 (0.08)		0.60 (0.22)					0.09 (0.06)		
Mooneye	0.05 (0.04)						0.22 (0.10)	0.13 (0.10)		
Gizzard shad	13.38 (2.58)		18.44 (5.62)		28.67 (9.08)	4.08 (2.46)	1.34 (0.37)	12.52 (4.20)		
Spotfin shiner	10.92 (3.17)		6.04 (2.26)		0.33 (0.26)	5.00 (2.00)	0.82 (0.56)	20.35 (8.05)		
Common carp	6.29 (0.85)		5.60 (1.11)		5.92 (2.32)	4.42 (1.74)	0.47 (0.13)	8.13 (1.68)		
Silver chub	0.02 (0.02)					0.08 (0.08)				
Golden shiner	0.67 (0.42)		1.96 (1.25)							
Emerald shiner	4.55 (1.23)		1.60 (0.95)		6.00 (2.21)	10.25 (4.68)	3.31 (2.28)	3.57 (1.34)		
River shiner	3.60 (1.14)		0.12 (0.07)		1.58 (0.84)	12.25 (4.90)		1.78 (0.62)		
Spottail shiner	0.53 (0.17)		0.20 (0.10)		0.50 (0.42)	0.17 (0.11)	0.10 (0.10)	1.04 (0.44)		
Channel shiner	0.36 (0.15)		0.04 (0.04)			1.00 (0.52)	0.10 (0.10)	0.30 (0.22)		
Pugnose minnow	0.63 (0.15)		1.56 (0.40)					0.26 (0.16)		
Bullhead minnow	3.41 (0.74)		3.56 (1.19)			0.67 (0.33)	0.03 (0.03)	5.39 (1.64)		
River carpsucker	0.07 (0.03)		0.04 (0.04)			0.17 (0.11)		0.04 (0.04)		
Quillback	0.73 (0.18)		0.20 (0.10)		6.33 (2.90)	0.50 (0.29)	0.14 (0.07)	0.61 (0.22)		
Blue sucker							0.03 (0.03)			
Smallmouth buffalo	0.58 (0.15)		0.80 (0.28)		0.17 (0.17)	0.67 (0.41)		0.39 (0.15)		
Bigmouth buffalo	0.08 (0.07)		0.24 (0.20)				0.05 (0.05)			
Spotted sucker	1.17 (0.23)		2.84 (0.61)			0.08 (0.08)		0.48 (0.26)		
Silver redhorse	1.52 (0.26)		1.72 (0.54)		1.00 (0.44)	0.92 (0.40)	1.85 (0.65)	1.78 (0.40)		
River redhorse	0.02 (0.02)				0.08 (0.08)		1.12 (0.38)	0.04 (0.04)		
Golden redhorse	1.05 (0.21)		0.68 (0.22)		0.25 (0.13)	0.50 (0.15)	0.33 (0.16)	1.83 (0.52)		
Shorthead redhorse	4.67 (0.71)		3.68 (0.92)		3.17 (1.24)	4.67 (2.13)	8.91 (1.84)	5.74 (1.10)		
Channel catfish	0.26 (0.09)		0.28 (0.15)		0.33 (0.19)	0.50 (0.29)	0.05 (0.05)	0.09 (0.06)		
Flathead catfish	0.12 (0.04)		0.08 (0.06)		0.08 (0.08)	0.08 (0.08)	0.10 (0.07)	0.17 (0.08)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Northern pike	0.30 (0.07)		0.44 (0.16)		0.08 (0.08)	0.08 (0.08)		0.35 (0.12)		
Burbot	0.09 (0.06)					0.25 (0.25)		0.09 (0.06)		
Brook silverside	0.29 (0.09)		0.32 (0.21)		0.08 (0.08)	0.25 (0.18)		0.30 (0.12)		
White bass	1.82 (0.39)		1.04 (0.43)		7.50 (3.12)	2.17 (0.71)	0.25 (0.20)	1.57 (0.76)		
Yellow bass	0.01 (0.01)		0.04 (0.04)							
Rock bass	2.30 (0.56)		3.36 (1.49)		0.17 (0.11)	0.50 (0.29)	0.03 (0.03)	2.74 (0.61)		
Green sunfish	0.54 (0.26)		1.40 (0.75)					0.17 (0.08)		
Pumpkinseed	0.16 (0.12)		0.48 (0.36)							
Warmouth	0.04 (0.02)		0.08 (0.06)					0.04 (0.04)		
Orangespotted sunfish	1.00 (0.45)		1.00 (0.44)				0.05 (0.05)	1.74 (1.11)		
Bluegill	16.87 (4.01)		33.12 (8.95)		0.42 (0.19)	2.00 (0.66)	0.18 (0.15)	13.52 (6.92)		
Green sunfish x pumpkinseed	0.01 (0.01)		0.04 (0.04)							
Green sunfish x bluegill	0.01 (0.01)		0.04 (0.04)							
Smallmouth bass	3.05 (0.62)		0.72 (0.23)		4.25 (1.70)	5.92 (2.06)	2.06 (0.55)	3.26 (1.04)		
Largemouth bass	5.70 (1.04)		9.12 (1.65)		0.25 (0.13)	0.58 (0.23)	0.04 (0.04)	6.48 (2.30)		
White crappie	0.04 (0.03)		0.08 (0.08)					0.04 (0.04)		
Black crappie	1.45 (0.53)		2.96 (1.46)		0.17 (0.11)	0.08 (0.08)		1.09 (0.47)		
Western sand darter	0.06 (0.03)				0.08 (0.08)	0.25 (0.13)				
Mud darter	0.08 (0.04)		0.20 (0.10)					0.04 (0.04)		
Johnny darter	0.90 (0.36)		1.40 (0.98)		0.17 (0.17)	0.17 (0.17)		1.00 (0.35)		
Yellow perch	0.79 (0.17)		1.48 (0.36)		0.17 (0.17)			0.74 (0.30)		
Logperch	1.29 (0.37)		0.72 (0.27)		1.25 (0.58)	0.92 (0.53)	0.34 (0.19)	2.04 (0.88)		
Slenderhead darter	0.07 (0.03)		0.04 (0.04)		0.08 (0.08)			0.13 (0.07)		
River darter	0.02 (0.02)					0.08 (0.08)				
Sauger	0.62 (0.11)		0.60 (0.19)		1.00 (0.37)	0.17 (0.11)	0.08 (0.05)	0.87 (0.21)		
Walleye	0.23 (0.06)		0.40 (0.13)		0.08 (0.08)	0.17 (0.11)	0.58 (0.31)	0.13 (0.07)		
Freshwater drum	2.34 (0.55)		2.84 (0.80)		4.25 (2.33)	1.83 (0.93)	0.28 (0.19)	1.96 (1.09)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Chestnut lamprey	0.07 (0.04)							0.17 (0.11)		
Silver lamprey	0.05 (0.04)					0.08 (0.08)	0.16 (0.09)	0.08 (0.08)		
American brook lamprey	0.02 (0.02)					0.08 (0.08)				
Longnose gar	0.38 (0.19)		0.67 (0.49)			0.17 (0.11)	0.35 (0.27)	0.25 (0.18)		
Shortnose gar	0.21 (0.14)					0.17 (0.11)	0.19 (0.16)	0.42 (0.34)		
Bowfin	0.15 (0.08)		0.33 (0.21)					0.08 (0.08)		
Mooneye	0.60 (0.19)					1.50 (0.38)	1.42 (0.29)	0.58 (0.42)		
Gizzard shad	17.48 (4.80)		30.67 (11.61)			6.00 (2.91)	1.59 (0.43)	12.67 (5.81)		
Spotfin shiner	8.92 (3.06)		4.83 (3.72)			3.50 (1.60)	0.48 (0.29)	15.92 (6.87)		
Common carp	4.83 (1.48)		3.50 (2.50)			3.25 (1.18)	1.15 (0.51)	7.00 (2.88)		
Mississippi silvery minnow							0.56 (0.56)			
Silver chub	0.15 (0.07)					0.33 (0.22)		0.17 (0.11)		
Golden shiner	0.06 (0.06)		0.17 (0.17)							
Emerald shiner	14.39 (4.68)		8.50 (2.79)			30.08 (17.76)	3.45 (1.89)	10.25 (4.14)		
River shiner	8.69 (5.04)		0.33 (0.33)			31.00 (20.84)	0.33 (0.28)	2.75 (1.37)		
Spottail shiner	1.39 (0.52)		2.00 (1.10)			0.33 (0.26)		1.50 (0.85)		
Sand shiner	0.06 (0.06)		0.17 (0.17)							
Mimic shiner	0.07 (0.07)							0.17 (0.17)		
Channel shiner	10.17 (4.61)		0.67 (0.67)			25.50 (14.08)	0.05 (0.05)	9.50 (7.83)		
Pugnose minnow	0.62 (0.26)		1.50 (0.72)			0.08 (0.08)		0.17 (0.11)		
Fathead minnow	2.92 (2.92)		8.17 (8.17)							
Bullhead minnow	4.68 (0.97)		4.67 (2.04)			3.67 (1.25)	0.03 (0.03)	5.33 (1.42)		
River carpsucker	0.54 (0.32)		1.00 (0.82)			0.08 (0.08)	0.17 (0.17)	0.42 (0.34)		
Quillback	1.72 (0.61)		1.33 (1.15)			2.25 (1.48)	0.07 (0.07)	1.75 (0.68)		
Highfin carpsucker	0.02 (0.02)					0.08 (0.08)				
White sucker	0.06 (0.06)		0.17 (0.17)							
Blue sucker							0.15 (0.10)			
Northern hog sucker							0.04 (0.04)			
Smallmouth buffalo	0.99 (0.38)		1.67 (0.99)			0.67 (0.38)		0.58 (0.26)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Bigmouth buffalo	0.24 (0.12)		0.67 (0.33)							
Spotted sucker	1.58 (1.00)		4.17 (2.80)			0.08 (0.08)		0.17 (0.11)		
Silver redhorse	4.00 (0.81)		4.17 (1.87)			2.42 (0.57)	1.28 (0.37)	4.83 (1.10)		
River redhorse	0.17 (0.09)					0.42 (0.26)	2.49 (1.07)	0.17 (0.17)		
Golden redhorse	1.47 (0.44)		0.50 (0.22)			1.75 (0.95)	0.86 (0.41)	2.17 (0.92)		
Shorthead redhorse	9.90 (1.84)		3.67 (1.17)			16.58 (5.16)	15.11 (3.11)	11.42 (3.26)		
Channel catfish	0.34 (0.13)		0.17 (0.17)			0.75 (0.28)	0.42 (0.18)	0.25 (0.25)		
Tadpole madtom	0.03 (0.03)							0.08 (0.08)		
Flathead catfish	0.21 (0.09)					0.58 (0.23)	0.35 (0.23)	0.17 (0.17)		
Northern pike	0.48 (0.24)		1.00 (0.63)			0.25 (0.18)	0.04 (0.04)	0.17 (0.17)		
Trout-perch	0.03 (0.03)							0.08 (0.08)		
Burbot	0.07 (0.05)					0.17 (0.17)		0.08 (0.08)		
Brook silverside	0.88 (0.22)		1.17 (0.48)			0.83 (0.32)		0.67 (0.28)		
White bass	5.62 (1.19)		6.00 (2.80)			6.67 (1.42)	0.59 (0.23)	4.67 (1.35)		
Rock bass	3.68 (0.88)		1.00 (0.52)			5.08 (1.73)	0.43 (0.17)	5.25 (1.88)		
Green sunfish	0.29 (0.23)					0.08 (0.08)		0.67 (0.58)		
Pumpkinseed	0.33 (0.20)		0.83 (0.54)					0.08 (0.08)		
Orangespotted sunfish	0.78 (0.31)		1.00 (0.68)			0.50 (0.42)		0.75 (0.39)		
Bluegill	15.16 (7.66)		22.33 (17.87)			3.67 (1.49)	0.31 (0.31)	15.75 (10.55)		
Smallmouth bass	5.17 (1.16)		0.50 (0.34)			8.25 (2.55)	4.56 (1.22)	7.50 (2.46)		
Largemouth bass	3.90 (1.51)		5.17 (2.60)			0.08 (0.08)		5.08 (3.00)		
Black crappie	3.01 (1.34)		3.17 (2.40)			1.17 (0.44)	0.14 (0.11)	4.00 (2.57)		
Mud darter	0.18 (0.10)		0.17 (0.17)			0.08 (0.08)		0.25 (0.18)		
Johnny darter	0.11 (0.06)					0.17 (0.17)		0.17 (0.11)		
Yellow perch	1.63 (0.74)		3.00 (1.97)			0.08 (0.08)		1.33 (0.54)		
Logperch	0.80 (0.33)		0.67 (0.67)			1.08 (0.82)	0.38 (0.24)	0.75 (0.25)		
Slenderhead darter	0.15 (0.12)					0.50 (0.50)	0.12 (0.09)	0.08 (0.08)		
Sauger	6.24 (1.18)		3.50 (1.45)			7.33 (2.18)	0.90 (0.36)	8.08 (2.30)		
Walleye	2.88 (0.42)		2.17 (0.70)			3.08 (0.77)	1.17 (0.41)	3.42 (0.70)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 3

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Freshwater drum	16.24 (3.86)		15.67 (5.25)			14.58 (4.47)	5.67 (1.55)	17.83 (8.03)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.44 (0.12)		0.46 (0.14)		0.32 (0.14)					
Shortnose gar	2.69 (0.43)		2.81 (0.47)		1.86 (0.95)					
Bowfin	2.11 (0.43)		2.39 (0.50)		0.17 (0.11)					
Mooneye	0.02 (0.02)				0.17 (0.17)					
Gizzard shad	8.44 (7.05)		9.46 (8.12)		1.43 (0.56)					
Common carp	1.72 (0.50)		1.85 (0.58)		0.82 (0.40)					
Golden shiner	0.07 (0.04)		0.08 (0.04)							
Quillback	0.10 (0.08)		0.09 (0.09)		0.16 (0.16)					
White sucker	0.01 (0.01)				0.09 (0.09)					
Smallmouth buffalo	0.14 (0.07)		0.13 (0.08)		0.16 (0.16)					
Spotted sucker	0.73 (0.21)		0.84 (0.24)							
Silver redhorse	2.30 (0.45)		2.28 (0.51)		2.47 (0.85)					
Golden redhorse	0.12 (0.08)		0.14 (0.09)							
Shorthead redhorse	0.66 (0.19)		0.59 (0.21)		1.15 (0.46)					
Black bullhead	0.03 (0.03)		0.03 (0.03)							
Brown bullhead	0.03 (0.03)		0.03 (0.03)							
Channel catfish	0.09 (0.04)		0.08 (0.04)		0.17 (0.12)					
Flathead catfish	0.22 (0.08)		0.21 (0.08)		0.34 (0.19)					
Northern pike	0.77 (0.27)		0.86 (0.31)		0.09 (0.09)					
White bass	3.07 (0.52)		1.95 (0.53)		10.71 (2.01)					
Rock bass	0.25 (0.08)		0.27 (0.09)		0.08 (0.08)					
Pumpkinseed	0.14 (0.09)		0.17 (0.10)							
Warmouth	0.02 (0.02)		0.03 (0.03)							
Orangespotted sunfish	0.02 (0.02)		0.03 (0.03)							
Bluegill	20.52 (5.80)		23.24 (6.68)		1.85 (0.93)					
Largemouth bass	0.49 (0.18)		0.56 (0.20)							
White crappie	0.40 (0.14)		0.46 (0.16)							
Black crappie	15.05 (3.41)		16.45 (3.92)		5.46 (1.58)					
Yellow perch	0.84 (0.24)		0.96 (0.28)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Sauger	0.95 (0.70)		1.02 (0.80)		0.49 (0.15)					
Walleye	0.22 (0.10)		0.26 (0.12)							
Freshwater drum	1.98 (0.42)		1.20 (0.29)		7.28 (2.65)					

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.06 (0.03)	0.47 (0.24)								
Shortnose gar	0.29 (0.16)	2.32 (1.28)								
Bowfin	0.10 (0.05)	0.78 (0.37)								
Mooneye	0.01 (0.01)	0.08 (0.08)								
Gizzard shad	0.60 (0.26)	1.96 (1.78)		0.41 (0.16)						
Common carp	0.29 (0.11)	1.19 (0.53)		0.17 (0.10)						
Golden shiner	0.01 (0.01)	0.08 (0.08)								
Smallmouth buffalo	0.21 (0.10)	0.54 (0.31)		0.16 (0.10)						
Spotted sucker	0.03 (0.02)	0.23 (0.16)								
Silver redhorse	0.41 (0.19)	2.27 (1.09)		0.15 (0.15)						
Golden redhorse	0.07 (0.07)			0.07 (0.07)						
Shorthead redhorse	0.97 (0.29)	2.26 (0.96)		0.79 (0.31)						
Black bullhead	0.02 (0.02)	0.16 (0.16)								
Channel catfish	0.35 (0.20)	0.08 (0.08)		0.39 (0.23)						
Flathead catfish	0.16 (0.14)	0.16 (0.10)		0.16 (0.16)						
Northern pike	0.09 (0.04)	0.70 (0.33)								
White bass	3.97 (1.07)	0.48 (0.32)		4.46 (1.23)						
Rock bass	0.01 (0.01)	0.08 (0.08)								
Pumpkinseed	0.02 (0.02)	0.16 (0.16)								
Warmouth	0.05 (0.05)	0.40 (0.40)								
Bluegill	5.21 (4.75)	42.20 (38.57)								
Smallmouth bass	0.14 (0.14)			0.16 (0.16)						
Largemouth bass	0.01 (0.01)	0.08 (0.08)								
White crappie	0.09 (0.07)	0.75 (0.57)								
Black crappie	2.33 (0.81)	18.89 (6.56)								
Yellow perch	0.17 (0.07)	1.35 (0.60)								
Sauger	0.43 (0.21)	0.08 (0.08)		0.48 (0.24)						
Walleye	0.02 (0.01)	0.15 (0.10)								
Freshwater drum	6.54 (1.60)	2.43 (1.25)		7.12 (1.82)						

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Silver lamprey	0.02 (0.02)							0.06 (0.06)		
Longnose gar	0.17 (0.09)		0.19 (0.11)		0.16 (0.11)	0.32 (0.32)	0.08 (0.08)	0.06 (0.06)		
Shortnose gar	0.39 (0.12)		0.70 (0.27)		0.56 (0.27)	0.08 (0.08)		0.29 (0.19)		
Bowfin	0.06 (0.03)		0.12 (0.09)			0.07 (0.07)				
Gizzard shad	1.00 (0.28)		1.39 (0.58)		2.58 (1.43)	1.07 (0.76)	0.36 (0.36)	0.40 (0.20)		
Spotfin shiner	22.24 (5.12)		20.03 (8.59)		29.76 (15.54)	8.68 (5.85)	9.64 (7.00)	31.54 (10.38)		
Common carp	0.46 (0.17)		0.50 (0.16)		0.08 (0.08)	0.80 (0.64)		0.28 (0.20)		
Mississippi silvery minnow	0.02 (0.02)							0.05 (0.05)		
Golden shiner	0.27 (0.19)		0.79 (0.55)				0.09 (0.09)			
Emerald shiner	29.62 (23.80)		72.87 (70.02)		39.01 (19.41)	5.93 (2.40)	0.59 (0.43)	4.02 (2.90)		
River shiner	6.47 (2.40)		6.71 (3.90)		52.04 (37.04)	3.01 (1.50)		2.44 (2.04)		
Spottail shiner	1.91 (0.73)		1.84 (0.93)		0.53 (0.26)	2.06 (1.91)		2.09 (1.31)		
Sand shiner					0.07 (0.07)					
Weed shiner	0.04 (0.03)		0.04 (0.04)					0.06 (0.06)		
Channel shiner	1.73 (1.09)		1.11 (0.86)		3.59 (3.33)	0.48 (0.34)		2.81 (2.75)		
Pugnose minnow	10.18 (4.34)		19.34 (11.19)		0.67 (0.67)	0.32 (0.22)		9.21 (5.58)		
Bluntnose minnow	0.02 (0.02)					0.08 (0.08)				
Bullhead minnow	57.18 (46.26)		150.05 (136.25)		1.70 (0.82)	2.76 (2.00)	3.61 (2.46)	14.22 (4.51)		
Quillback	0.53 (0.25)		0.30 (0.22)		0.49 (0.36)	1.29 (0.90)		0.29 (0.29)		
Silver redhorse	0.16 (0.05)		0.39 (0.15)		0.15 (0.10)	0.07 (0.07)				
Shorthead redhorse	0.81 (0.29)		1.12 (0.59)		0.08 (0.08)	1.36 (0.88)	0.08 (0.08)	0.29 (0.14)		
Black bullhead	0.01 (0.01)		0.04 (0.04)							
Channel catfish	0.07 (0.06)		0.04 (0.04)		0.08 (0.08)	0.24 (0.24)				
Tadpole madtom	0.12 (0.06)		0.12 (0.09)			0.07 (0.07)		0.17 (0.12)		
Northern pike	0.04 (0.04)							0.11 (0.11)		
Central mudminnow	0.02 (0.02)					0.08 (0.08)				
Brook silverside	0.52 (0.28)		0.75 (0.63)		0.23 (0.12)	0.08 (0.08)		0.62 (0.49)		
White bass	1.33 (0.62)		0.68 (0.28)		2.84 (0.82)	3.54 (2.63)	0.17 (0.12)	0.38 (0.24)		
Rock bass	0.26 (0.11)		0.12 (0.07)		0.08 (0.08)			0.57 (0.29)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Green sunfish	0.21 (0.11)		0.12 (0.09)		0.08 (0.08)	0.08 (0.08)		0.39 (0.29)		
Pumpkinseed	0.30 (0.17)		0.33 (0.18)			0.08 (0.08)		0.46 (0.41)		
Orangespotted sunfish	2.79 (2.07)		6.60 (6.03)		0.08 (0.08)	0.08 (0.08)		1.37 (0.90)		
Bluegill	12.39 (4.21)		13.47 (4.19)		3.65 (2.46)	2.89 (1.10)	0.31 (0.17)	18.40 (10.47)		
Smallmouth bass	0.08 (0.04)		0.04 (0.04)		0.08 (0.08)			0.17 (0.09)		
Largemouth bass	21.14 (19.76)		3.60 (2.91)		0.16 (0.16)	0.24 (0.12)		52.44 (52.24)		
White crappie	0.19 (0.10)		0.37 (0.26)		0.08 (0.08)	0.08 (0.08)		0.11 (0.08)		
Black crappie	1.08 (0.29)		1.82 (0.63)		0.33 (0.19)	0.65 (0.41)	0.74 (0.50)	0.78 (0.44)		
Mud darter	0.47 (0.21)		0.78 (0.54)			0.17 (0.17)		0.45 (0.27)		
Johnny darter	1.20 (0.38)		1.40 (0.91)		1.24 (0.68)	0.61 (0.46)		1.37 (0.50)		
Yellow perch	0.03 (0.02)		0.08 (0.06)		0.08 (0.08)					
Logperch	1.05 (0.52)		0.44 (0.27)			0.57 (0.42)		2.03 (1.33)		
Slenderhead darter	0.74 (0.71)				0.08 (0.08)			1.95 (1.89)		
Sauger	0.03 (0.02)		0.04 (0.04)			0.09 (0.09)				
Walleye	0.04 (0.03)							0.11 (0.08)		
Freshwater drum	0.47 (0.10)		0.44 (0.16)		1.11 (0.37)	0.79 (0.33)	1.40 (0.48)	0.22 (0.10)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.02 (0.02)	0.17 (0.17)								
Bowfin	0.01 (0.01)	0.07 (0.07)								
Gizzard shad	0.16 (0.08)	0.67 (0.32)		0.09 (0.09)						
Common carp	0.25 (0.23)	0.25 (0.25)		0.26 (0.26)						
Golden shiner	0.08 (0.08)	0.08 (0.08)		0.09 (0.09)						
Emerald shiner	0.37 (0.24)	0.09 (0.09)		0.41 (0.27)						
River shiner	0.02 (0.02)	0.17 (0.17)								
Spottail shiner	1.49 (1.49)			1.70 (1.70)						
Channel shiner	0.10 (0.08)	0.22 (0.22)		0.08 (0.08)						
Pugnose minnow	0.96 (0.47)	7.82 (3.82)								
Bullhead minnow	0.18 (0.09)	0.90 (0.46)		0.08 (0.08)						
Quillback	0.09 (0.08)	0.09 (0.09)		0.09 (0.09)						
Golden redhorse	0.01 (0.01)	0.09 (0.09)								
Shorthead redhorse	0.15 (0.09)	0.07 (0.07)		0.17 (0.10)						
Channel catfish	0.45 (0.37)			0.51 (0.42)						
Tadpole madtom	0.01 (0.01)	0.08 (0.08)								
White bass	0.99 (0.48)	0.73 (0.39)		1.03 (0.55)						
Orangespotted sunfish	0.80 (0.50)	6.47 (4.06)								
Bluegill	8.69 (8.29)	68.08 (67.28)		0.34 (0.25)						
Largemouth bass	0.01 (0.01)	0.08 (0.08)								
White crappie	0.04 (0.03)	0.35 (0.26)								
Black crappie	0.42 (0.18)	1.58 (0.84)		0.25 (0.17)						
Johnny darter	0.17 (0.10)	0.17 (0.17)		0.17 (0.11)						
Yellow perch	0.02 (0.02)	0.17 (0.17)								
Logperch	0.12 (0.08)	0.39 (0.30)		0.09 (0.09)						
Slenderhead darter	0.02 (0.02)	0.15 (0.15)								
Walleye	0.15 (0.09)			0.17 (0.10)						
Freshwater drum	1.47 (0.53)	0.49 (0.19)		1.61 (0.60)						

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Silver lamprey						0.04 (0.04)				
Longnose gar	0.01 (0.01)							0.04 (0.04)		
Shortnose gar	0.03 (0.03)			0.04 (0.04)						
Bowfin	0.01 (0.01)	0.12 (0.09)								
Gizzard shad	0.03 (0.03)			0.04 (0.04)						
Common carp	0.16 (0.06)	0.04 (0.04)		0.16 (0.09)		0.33 (0.13)	0.20 (0.09)	0.13 (0.07)		
Silver chub	0.06 (0.03)			0.04 (0.04)		0.29 (0.16)	0.04 (0.04)	0.04 (0.04)		
Smallmouth buffalo	0.08 (0.05)			0.12 (0.09)			0.04 (0.04)	0.04 (0.04)		
Spotted sucker	0.01 (0.01)	0.09 (0.09)								
Silver redhorse	0.12 (0.07)			0.16 (0.12)		0.04 (0.04)		0.08 (0.06)		
Golden redhorse							0.04 (0.04)			
Shorthead redhorse	0.72 (0.37)	0.04 (0.04)		0.82 (0.58)		0.66 (0.46)	0.67 (0.50)	0.74 (0.40)		
Channel catfish	2.68 (0.72)	3.00 (1.89)		3.05 (1.11)		2.38 (0.86)	2.81 (1.53)	1.49 (0.42)		
White bass	0.03 (0.03)	0.04 (0.04)		0.04 (0.04)						
Rock bass	0.04 (0.02)					0.04 (0.04)	0.16 (0.09)	0.16 (0.11)		
Warmouth	0.01 (0.01)	0.09 (0.09)								
Bluegill	0.07 (0.06)	0.82 (0.73)					0.20 (0.20)			
Smallmouth bass						0.04 (0.04)				
White crappie	0.01 (0.01)	0.17 (0.17)								
Black crappie	0.10 (0.04)	1.09 (0.41)						0.04 (0.04)		
Yellow perch	0.01 (0.01)	0.13 (0.07)								
Walleye		0.04 (0.04)								
Freshwater drum	0.48 (0.32)	0.46 (0.15)		0.56 (0.52)		0.59 (0.31)	0.57 (0.37)	0.17 (0.09)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Silver lamprey	0.02 (0.01)					0.08 (0.06)		0.04 (0.04)		
Longnose gar	0.01 (0.01)	0.08 (0.08)								
Shortnose gar	0.04 (0.03)	0.13 (0.09)		0.04 (0.04)						
Bowfin	0.03 (0.03)	0.37 (0.33)					0.04 (0.04)			
Gizzard shad	0.05 (0.05)	0.04 (0.04)		0.08 (0.08)						
Common carp	1.43 (0.48)	1.01 (0.67)		1.81 (0.77)		0.87 (0.43)	0.21 (0.09)	0.71 (0.19)		
Smallmouth buffalo	0.56 (0.19)	0.33 (0.28)		0.44 (0.24)		0.71 (0.24)	1.04 (0.62)	0.96 (0.63)		
Spotted sucker	0.01 (0.00)	0.08 (0.06)								
Silver redhorse	0.77 (0.39)	0.70 (0.42)		1.09 (0.63)		0.17 (0.09)	0.13 (0.07)	0.08 (0.08)		
Golden redhorse						0.04 (0.04)				
Shorthead redhorse	0.62 (0.16)	0.54 (0.28)		0.75 (0.25)		0.36 (0.24)	0.58 (0.23)	0.37 (0.15)		
Black bullhead		0.04 (0.04)								
Brown bullhead		0.04 (0.04)								
Channel catfish	1.04 (0.47)	0.87 (0.47)		1.05 (0.75)		0.54 (0.26)	0.37 (0.15)	1.41 (0.46)		
Flathead catfish	0.05 (0.03)	0.08 (0.08)		0.04 (0.04)		0.08 (0.08)	0.24 (0.14)	0.04 (0.04)		
Northern pike	0.02 (0.01)	0.13 (0.09)					0.04 (0.04)	0.04 (0.04)		
White bass	0.05 (0.03)	0.20 (0.20)		0.04 (0.04)		0.04 (0.04)	0.04 (0.04)	0.04 (0.04)		
Bluegill	0.04 (0.03)	0.04 (0.04)		0.04 (0.04)				0.04 (0.04)		
Smallmouth bass	0.03 (0.03)			0.04 (0.04)		0.04 (0.04)	0.04 (0.04)			
White crappie		0.04 (0.04)								
Black crappie	0.15 (0.05)	0.97 (0.37)		0.04 (0.04)		0.04 (0.04)	0.13 (0.07)	0.17 (0.17)		
Walleye							0.04 (0.04)			
Freshwater drum	0.62 (0.45)	0.25 (0.13)		0.76 (0.72)		0.38 (0.20)	0.28 (0.19)	0.50 (0.26)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Gizzard shad	6.76 (4.88)		0.42 (0.26)			21.71 (19.52)		3.42 (3.33)		
Spotfin shiner	30.58 (8.89)		21.92 (9.54)			15.92 (3.99)		47.25 (20.43)		
Common carp	0.31 (0.15)		0.58 (0.40)			0.13 (0.09)		0.17 (0.11)		
Mississippi silvery minnow	0.04 (0.03)		0.08 (0.08)			0.04 (0.04)				
Golden shiner	0.07 (0.07)							0.17 (0.17)		
Emerald shiner	27.62 (6.05)		11.42 (3.66)			48.88 (17.73)		29.33 (10.23)		
River shiner	25.28 (12.67)		28.83 (25.38)			18.13 (3.91)		26.42 (21.99)		
Spottail shiner	2.38 (1.07)		4.67 (2.72)			0.42 (0.29)		1.50 (1.10)		
Sand shiner	0.01 (0.01)					0.04 (0.04)				
Channel shiner	3.02 (1.33)		1.67 (1.05)			3.96 (1.59)		3.67 (3.05)		
Pugnose minnow	2.71 (1.50)		0.75 (0.30)			0.58 (0.30)		5.75 (3.75)		
Bullhead minnow	10.51 (2.98)		18.75 (7.91)			2.54 (1.00)		7.92 (2.17)		
Quillback	18.63 (18.05)					2.33 (2.12)		45.25 (45.25)		
Smallmouth buffalo	0.01 (0.01)					0.04 (0.04)				
Spotted sucker	0.10 (0.07)							0.25 (0.18)		
Silver redhorse	0.31 (0.15)		0.25 (0.25)			0.08 (0.06)		0.50 (0.29)		
River redhorse	0.01 (0.01)					0.04 (0.04)				
Golden redhorse	0.03 (0.03)							0.08 (0.08)		
Shorthead redhorse	0.58 (0.25)		0.58 (0.50)			0.17 (0.10)		0.83 (0.42)		
Northern pike	0.06 (0.04)		0.08 (0.08)					0.08 (0.08)		
Trout-perch	0.01 (0.01)					0.04 (0.04)				
Brook silverside	1.10 (0.44)		0.58 (0.50)			2.29 (1.38)		0.83 (0.58)		
White bass	0.74 (0.32)		0.58 (0.36)			2.04 (1.20)		0.08 (0.08)		
Rock bass	0.03 (0.03)							0.08 (0.08)		
Orangespotted sunfish	0.73 (0.66)		0.08 (0.08)					1.75 (1.66)		
Bluegill	1.83 (0.78)		2.58 (1.19)			0.17 (0.10)		2.17 (1.65)		
Smallmouth bass	0.18 (0.06)					0.63 (0.22)		0.08 (0.08)		
Largemouth bass	3.55 (2.77)		8.75 (7.71)			0.17 (0.10)		0.92 (0.53)		
Black crappie	0.08 (0.07)					0.04 (0.04)		0.17 (0.17)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Western sand darter	1.21 (0.60)					2.13 (1.02)		1.75 (1.36)		
Mud darter	0.15 (0.10)		0.33 (0.26)					0.08 (0.08)		
Johnny darter	2.68 (1.41)		1.33 (0.76)			0.42 (0.33)		5.25 (3.47)		
Yellow perch	0.36 (0.15)		0.33 (0.26)			0.29 (0.25)		0.42 (0.26)		
Logperch	0.41 (0.12)		0.33 (0.19)			0.67 (0.30)		0.33 (0.19)		
Slenderhead darter	0.06 (0.04)					0.13 (0.07)		0.08 (0.08)		
River darter	0.10 (0.08)					0.29 (0.29)		0.08 (0.08)		
Sauger	0.06 (0.04)					0.13 (0.13)		0.08 (0.08)		
Walleye	0.20 (0.13)		0.33 (0.33)			0.33 (0.22)				
Freshwater drum	0.06 (0.04)		0.08 (0.08)					0.08 (0.08)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.10. Mean catch-per-unit-effort and (standard error) for fishes collected by gill netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.42 (0.20)			0.42 (0.20)						
Bowfin	0.85 (0.61)			0.85 (0.61)						
Mooneye	1.04 (1.04)			1.04 (1.04)						
Common carp	1.28 (0.70)			1.28 (0.70)						
River carpsucker	0.15 (0.15)			0.15 (0.15)						
Silver redhorse	1.61 (1.47)			1.61 (1.47)						
Shorthead redhorse	0.29 (0.18)			0.29 (0.18)						
Channel catfish	0.58 (0.44)			0.58 (0.44)						
Flathead catfish	0.13 (0.13)			0.13 (0.13)						
Northern pike	0.28 (0.18)			0.28 (0.18)						
White bass	0.15 (0.15)			0.15 (0.15)						
Smallmouth bass	0.15 (0.15)			0.15 (0.15)						
Sauger	0.14 (0.14)			0.14 (0.14)						
Walleye	0.15 (0.15)			0.15 (0.15)						
Freshwater drum	1.10 (0.45)			1.10 (0.45)						

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.3.11. Mean catch-per-unit-effort and (standard error) for fishes collected by anchored trammel netting in Pool 8 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Common carp	0.19 (0.19)			0.19 (0.19)						

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar		0.14 (0.09)							
Bowfin		0.07 (0.07)							
Goldeye		0.07 (0.07)							
Gizzard shad		16.73 (6.90)							
Spotfin shiner		6.08 (2.13)							
Common carp		1.24 (0.39)							
Emerald shiner		0.39 (0.18)							
River shiner		0.90 (0.61)							
Spottail shiner		0.36 (0.23)							
Pugnose minnow		0.46 (0.18)							
Bullhead minnow		4.77 (2.47)							
River carpsucker		0.06 (0.06)							
Quillback		1.56 (0.74)							
White sucker		0.06 (0.06)							
Smallmouth buffalo		0.31 (0.31)							
Spotted sucker		4.44 (1.89)							
Silver redhorse		3.86 (1.24)							
Golden redhorse		1.45 (0.45)							
Shorthead redhorse		2.57 (0.61)							
Channel catfish		0.07 (0.07)							
Tadpole madtom		0.08 (0.08)							
Northern pike		1.05 (0.30)							
Brook silverside		0.26 (0.11)							
White bass		0.54 (0.21)							
Rock bass		2.42 (0.83)							
Green sunfish		0.22 (0.12)							
Pumpkinseed		0.22 (0.12)							
Orangespotted sunfish		0.44 (0.37)							
Bluegill		11.32 (4.30)							
Smallmouth bass		1.86 (0.81)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Largemouth bass		8.89 (1.98)							
Black crappie		0.69 (0.39)							
Johnny darter		0.17 (0.17)							
Yellow perch		0.99 (0.29)							
Logperch		1.38 (0.60)							
Sauger		0.83 (0.28)							
Walleye		0.65 (0.33)							
Freshwater drum		2.44 (1.21)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Chestnut lamprey									0.05 (0.05)
Silver lamprey									0.17 (0.12)
Longnose gar									0.37 (0.19)
Shortnose gar									0.21 (0.12)
Bowfin									0.39 (0.21)
Mooneye									0.52 (0.24)
Gizzard shad									19.29 (7.77)
Spotfin shiner									0.55 (0.22)
Common carp									2.59 (0.52)
Silver chub									0.13 (0.09)
Emerald shiner									1.91 (0.68)
River shiner									2.91 (1.59)
Spottail shiner									0.11 (0.11)
Sand shiner									0.10 (0.10)
Channel shiner									0.75 (0.37)
Pugnose minnow									0.80 (0.80)
Bullhead minnow									0.41 (0.24)
River carpsucker									0.29 (0.11)
Quillback									5.65 (2.42)
Highfin carpsucker									0.04 (0.04)
Smallmouth buffalo									0.89 (0.64)
Bigmouth buffalo									0.16 (0.11)
Spotted sucker									0.42 (0.25)
Silver redhorse									1.71 (0.58)
River redhorse									0.13 (0.09)
Golden redhorse									2.26 (0.90)
Shorthead redhorse									9.08 (2.69)
Channel catfish									0.46 (0.29)
Flathead catfish									0.69 (0.33)
Northern pike									0.82 (0.27)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Burbot									0.71 (0.33)
Brook silverside									0.40 (0.33)
White bass									45.91 (8.99)
Yellow bass									0.05 (0.05)
Rock bass									1.77 (0.82)
Green sunfish									0.04 (0.04)
Pumpkinseed									0.05 (0.05)
Bluegill									8.07 (3.25)
Smallmouth bass									12.66 (3.58)
Largemouth bass									5.43 (2.23)
Black crappie									1.31 (0.37)
Western sand darter									0.08 (0.08)
Yellow perch									2.59 (0.92)
Logperch									0.36 (0.17)
Sauger									34.07 (7.94)
Walleye									17.25 (5.35)
Freshwater drum									21.21 (3.75)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCEW	SCB	TRI	TWZ
Silver lamprey		0.08 (0.08)							
Longnose gar		0.65 (0.49)							
Shortnose gar		0.08 (0.08)							
Bowfin		0.56 (0.25)							
Gizzard shad		0.17 (0.17)							
Common carp		0.48 (0.22)							
Smallmouth buffalo		0.43 (0.30)							
Spotted sucker		0.25 (0.13)							
Silver redhorse		0.65 (0.25)							
River redhorse		0.08 (0.08)							
Golden redhorse		0.17 (0.11)							
Shorthead redhorse		1.14 (0.54)							
Channel catfish		0.51 (0.29)							
Flathead catfish		0.09 (0.09)							
Northern pike		0.93 (0.38)							
White bass		1.95 (1.24)							
Rock bass		0.73 (0.51)							
Green sunfish		0.08 (0.08)							
Pumpkinseed		0.84 (0.59)							
Bluegill		54.61 (21.10)							
Green sunfish x bluegill		0.17 (0.12)							
Largemouth bass		0.34 (0.15)							
White crappie		0.41 (0.23)							
Black crappie		28.63 (6.70)							
Yellow perch		2.76 (1.43)							
Sauger		0.76 (0.31)							
Walleye		0.34 (0.26)							
Freshwater drum		2.67 (1.25)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar									0.16 (0.16)
Gizzard shad									0.18 (0.18)
Spotfin shiner									22.85 (10.03)
Common carp									3.02 (3.02)
Emerald shiner									33.95 (25.72)
River shiner									10.77 (10.21)
Spottail shiner									28.09 (27.36)
Channel shiner									24.39 (22.27)
Fathead minnow									0.14 (0.14)
Bullhead minnow									4.64 (4.64)
Spotted sucker									0.48 (0.48)
Brook silverside									1.23 (1.23)
White bass									1.19 (0.83)
Bluegill									10.84 (8.49)
Smallmouth bass									1.43 (1.25)
Largemouth bass									1.89 (1.07)
Black crappie									0.50 (0.36)
Yellow perch									0.16 (0.16)
Logperch									0.18 (0.18)
Freshwater drum									0.18 (0.18)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Common carp									1.23 (0.37)
Silver chub									0.17 (0.17)
Golden redhorse									0.08 (0.08)
Shorthead redhorse									0.93 (0.93)
Channel catfish									2.27 (1.07)
Flathead catfish									0.32 (0.24)
White bass									0.08 (0.08)
Rock bass									0.16 (0.16)
Freshwater drum									2.52 (1.29)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Common carp									2.03 (0.68)
Smallmouth buffalo									1.67 (1.22)
Silver redhorse									0.08 (0.08)
Shorthead redhorse									0.50 (0.18)
Channel catfish									1.32 (0.62)
Flathead catfish									1.06 (0.61)
Northern pike									0.16 (0.16)
White bass									0.17 (0.17)
Freshwater drum									2.60 (0.73)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Gizzard shad		5.17 (4.90)							9.17 (8.45)
Spotfin shiner		12.83 (6.21)							9.17 (2.85)
Common carp		0.08 (0.08)							0.17 (0.11)
Golden shiner									0.08 (0.08)
Emerald shiner		1.08 (0.76)							46.75 (16.93)
River shiner		0.17 (0.11)							10.75 (3.54)
Spottail shiner		0.17 (0.11)							0.17 (0.11)
Sand shiner									0.08 (0.08)
Channel shiner									4.67 (2.66)
Pugnose minnow		1.17 (0.93)							
Bullhead minnow		8.00 (4.16)							
River carpsucker									0.08 (0.08)
Quillback		0.42 (0.26)							0.50 (0.34)
Bigmouth buffalo									0.08 (0.08)
Spotted sucker		0.42 (0.15)							
Silver redhorse		0.33 (0.19)							0.17 (0.11)
Golden redhorse		0.08 (0.08)							0.08 (0.08)
Shorthead redhorse		0.17 (0.11)							
Brook silverside		1.58 (0.83)							0.92 (0.50)
White bass									0.25 (0.25)
Bluegill		4.42 (1.39)							0.25 (0.18)
Smallmouth bass		0.08 (0.08)							
Largemouth bass		9.25 (5.46)							1.42 (1.07)
Western sand darter									0.08 (0.08)
Johnny darter		0.33 (0.14)							0.25 (0.25)
Yellow perch									0.17 (0.11)
Logperch		0.58 (0.34)							0.33 (0.19)
River darter									0.08 (0.08)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 2.4.8. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in Pool 8 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Lake sturgeon									0.08 (0.08)
Shovelnose sturgeon									0.42 (0.26)
Common carp									0.17 (0.11)
Silver chub									0.25 (0.25)
Shorthead redhorse									0.42 (0.23)
Channel catfish									0.75 (0.49)
Sauger									0.58 (0.58)
Freshwater drum									6.33 (3.37)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

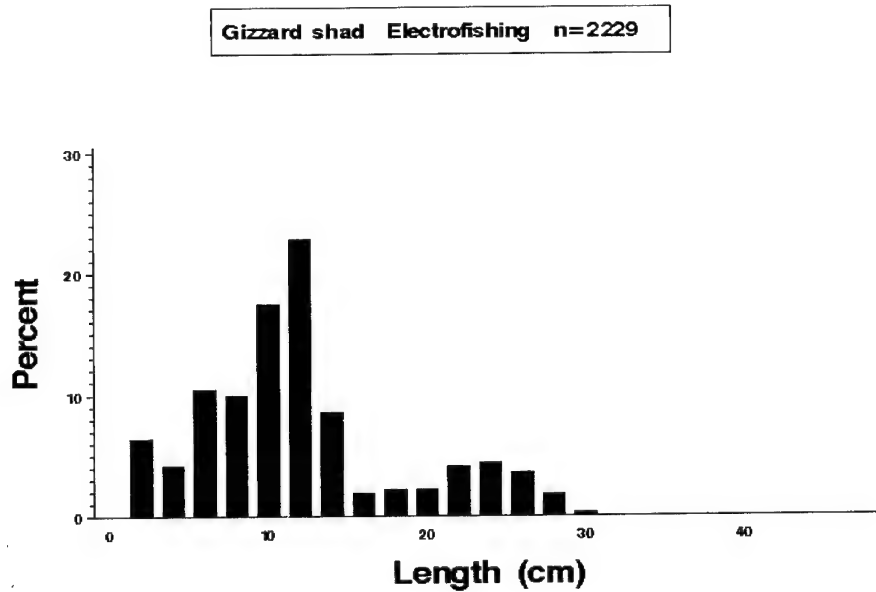


Figure 2.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

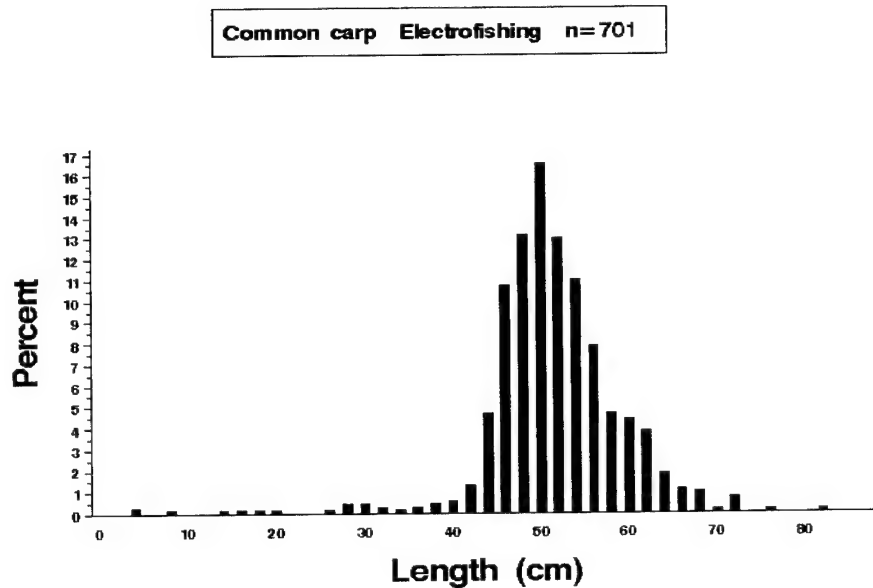


Figure 2.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

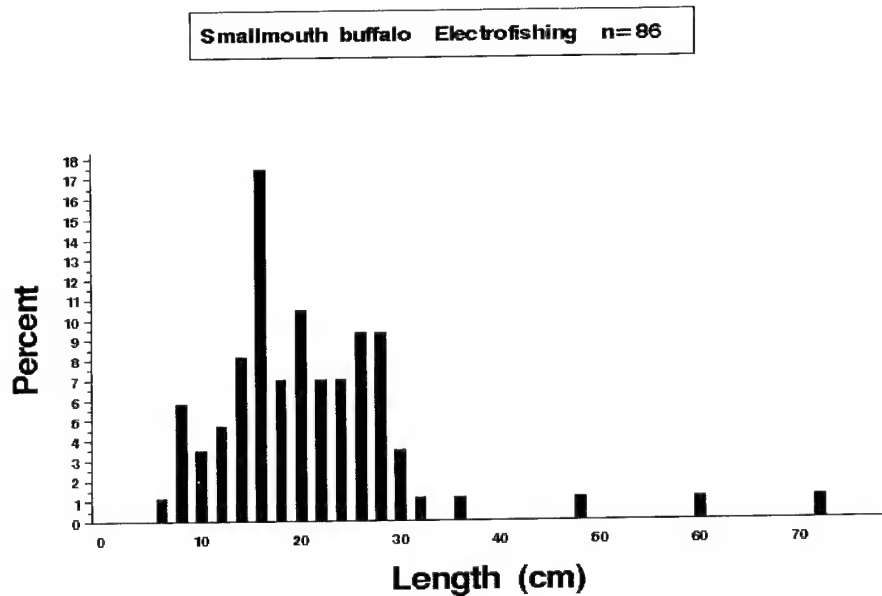


Figure 2.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

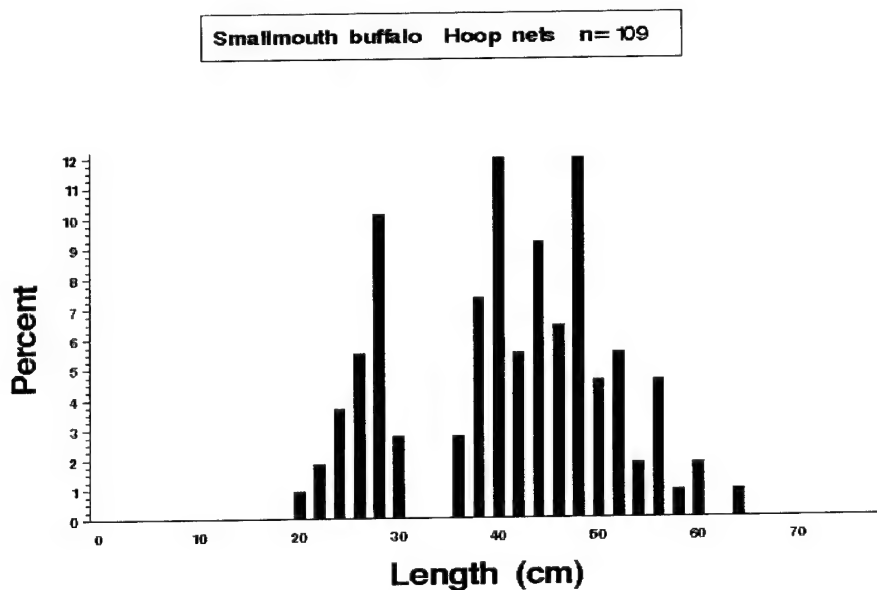


Figure 2.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by large and small hoop netting in Upper Mississippi River Pool 8 during 1995.

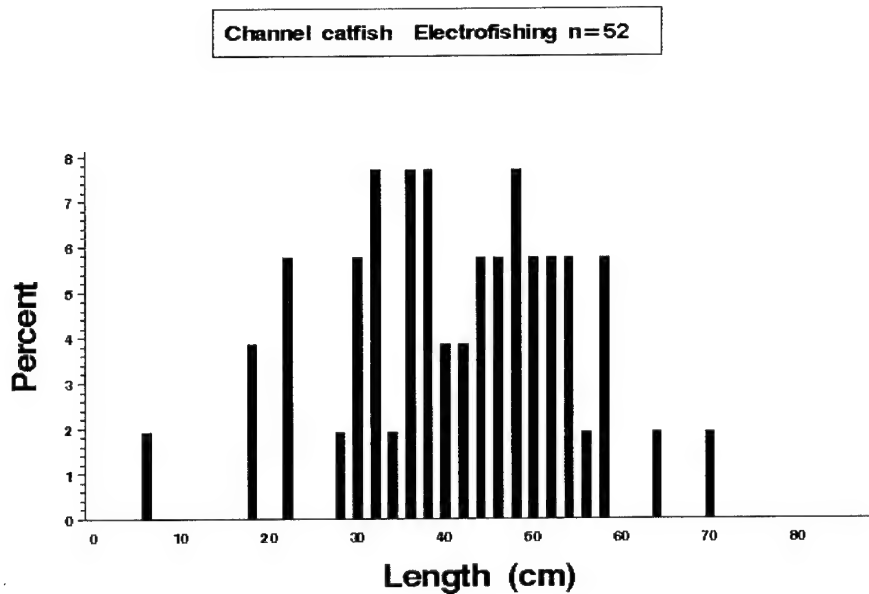


Figure 2.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

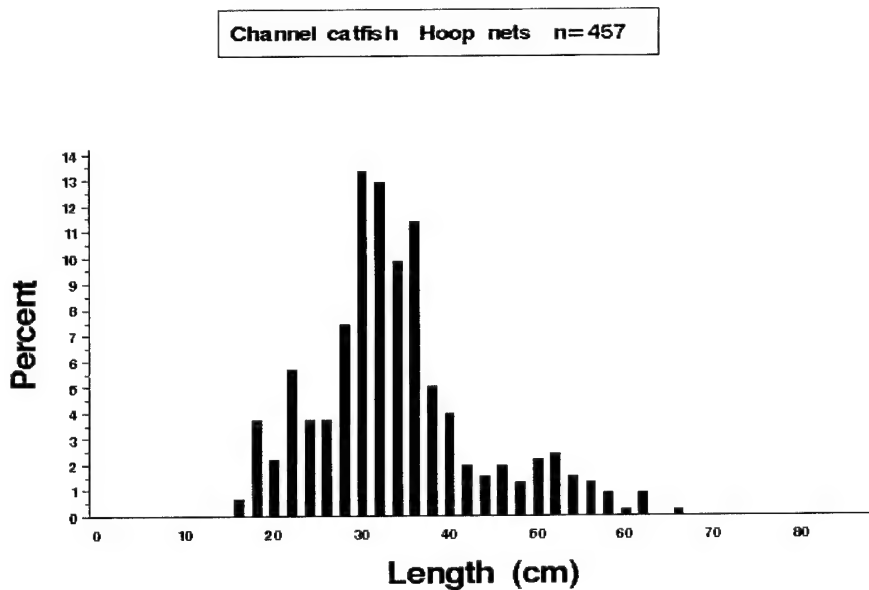


Figure 2.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by large and small hoop netting in Upper Mississippi River Pool 8 during 1995.

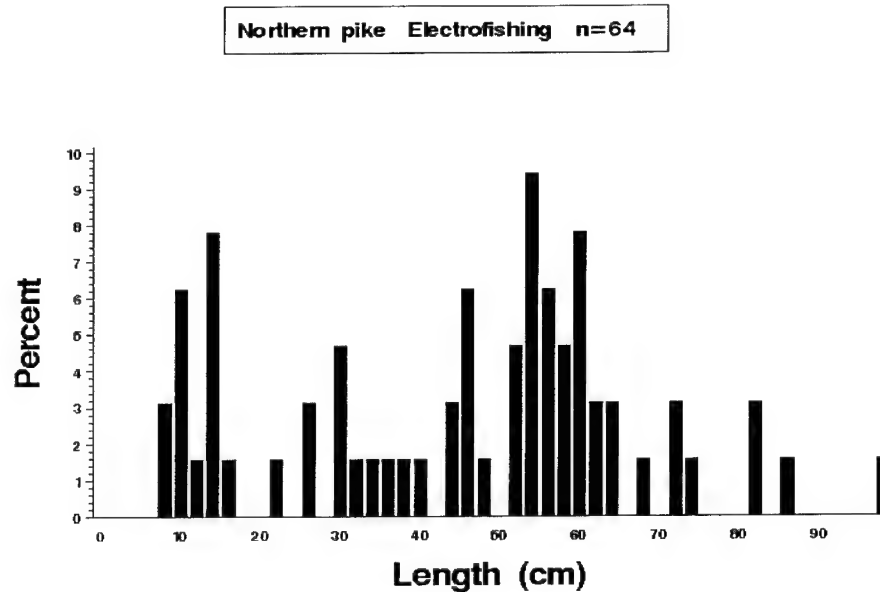


Figure 2.8. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

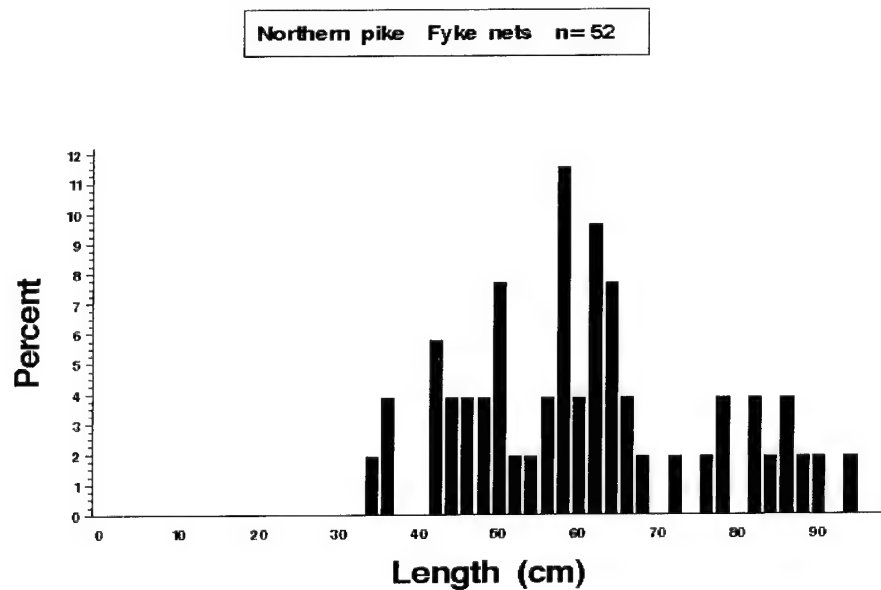


Figure 2.9. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 8 during 1995.

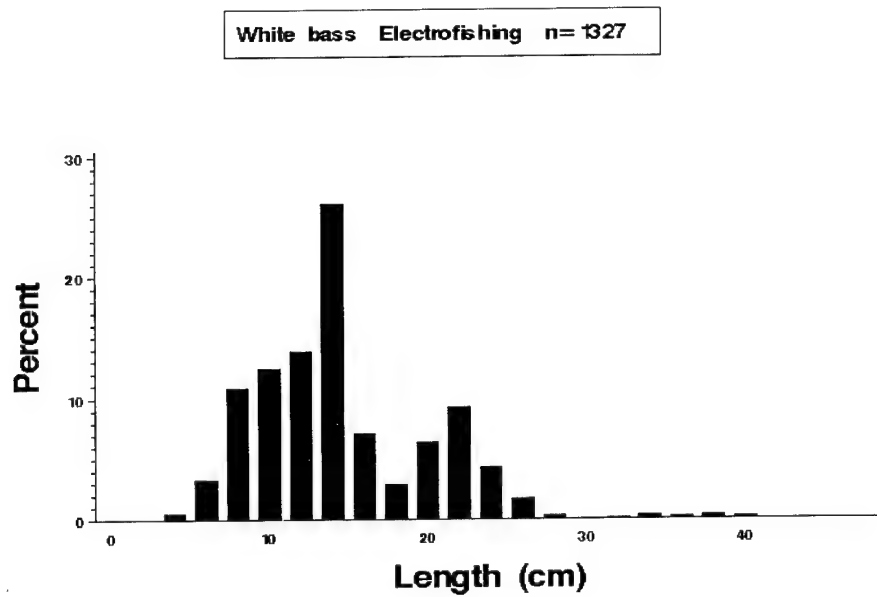


Figure 2.10. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

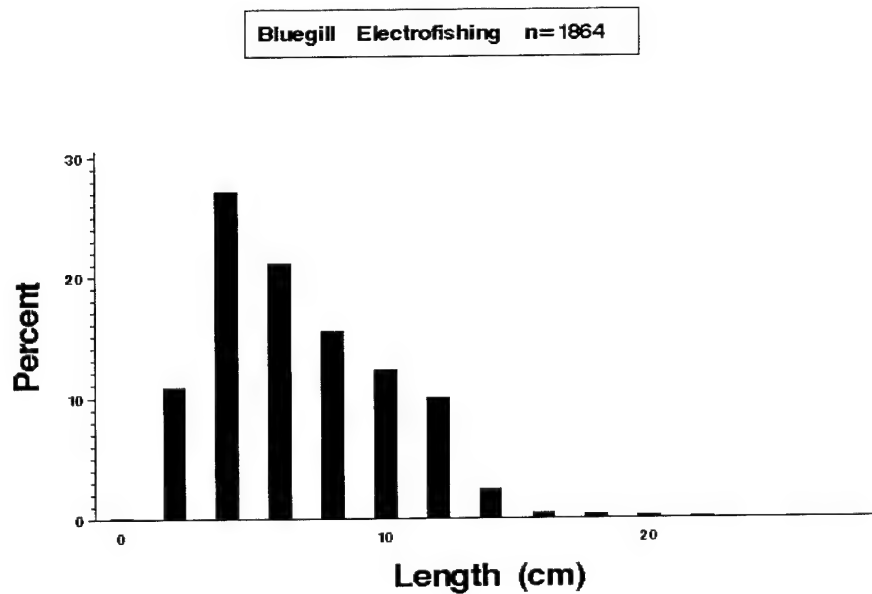


Figure 2.11. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

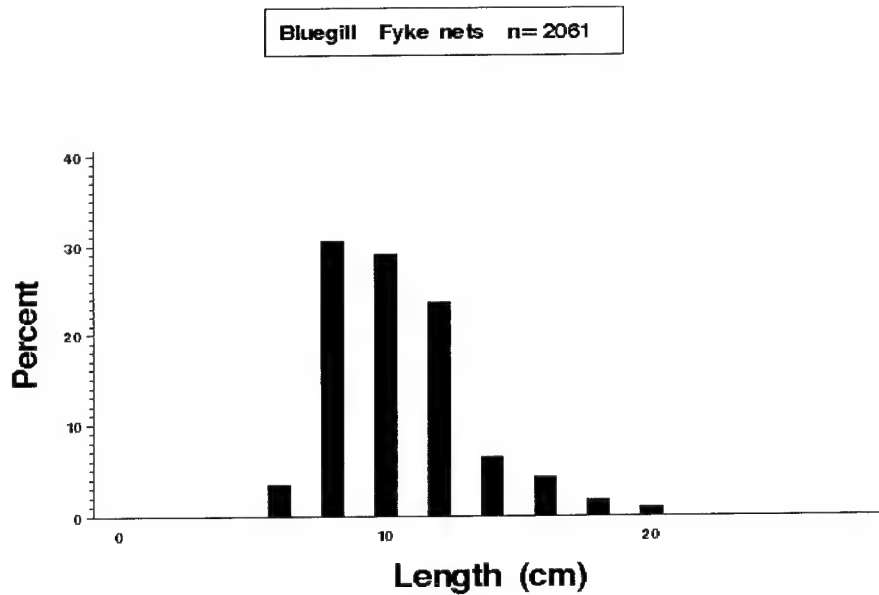


Figure 2.12. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 8 during 1995.

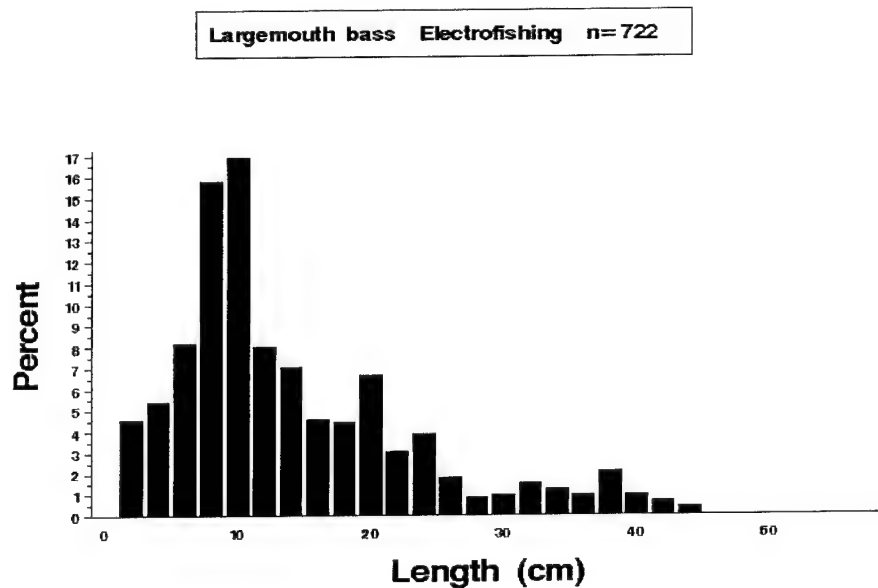


Figure 2.13. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

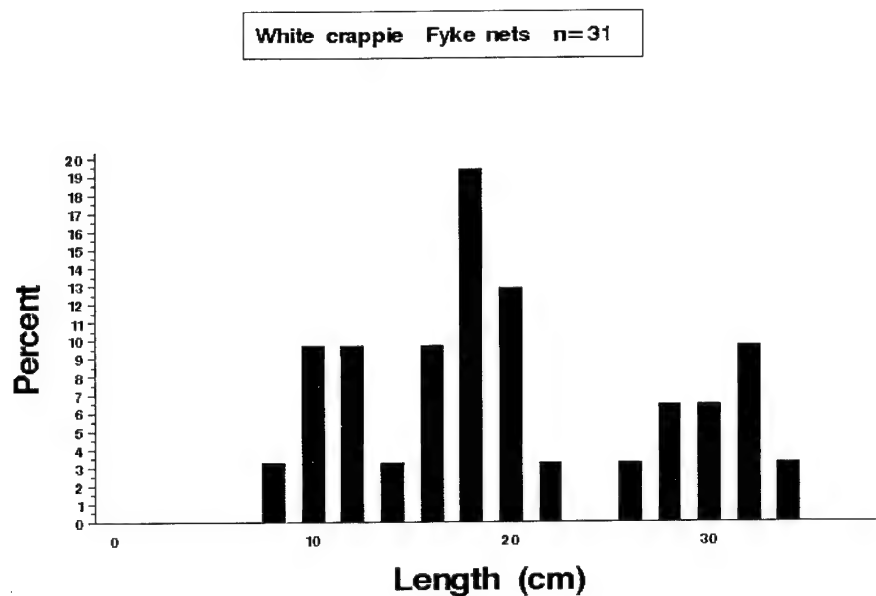


Figure 2.14. Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularis*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

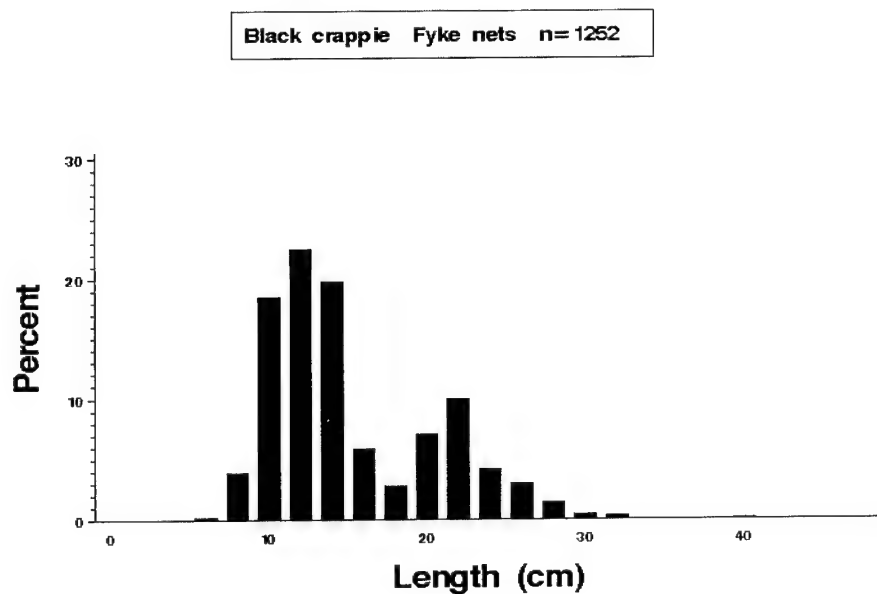


Figure 2.15. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

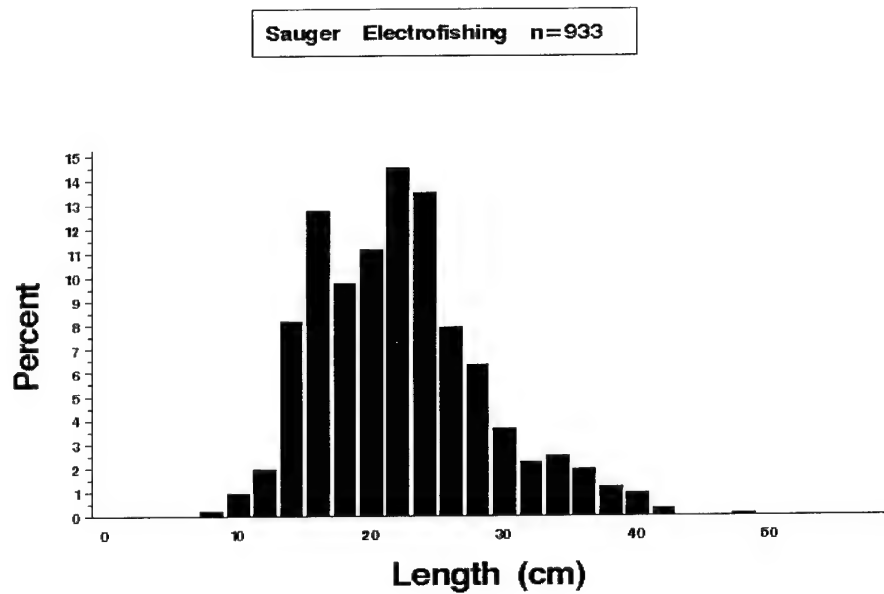


Figure 2.16. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

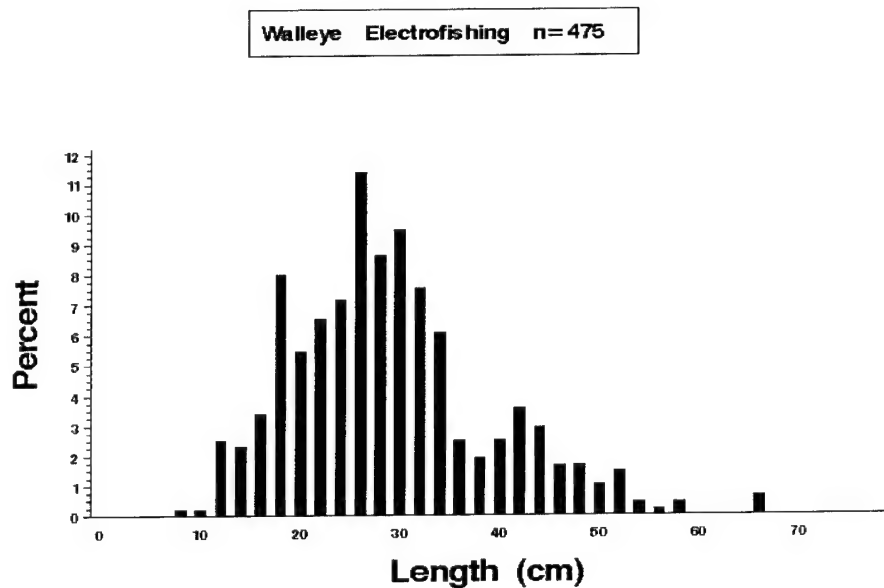


Figure 2.17. Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

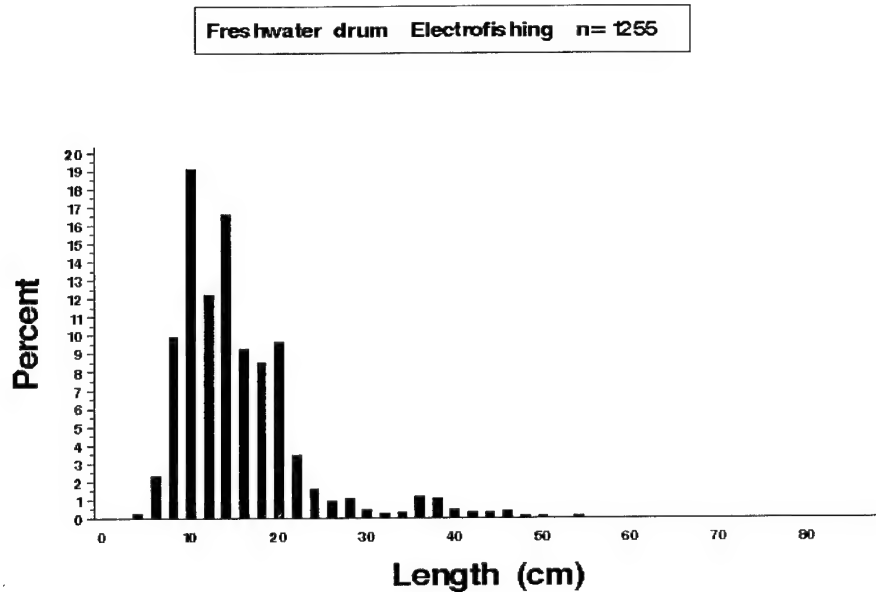


Figure 2.18. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 8 during 1995.

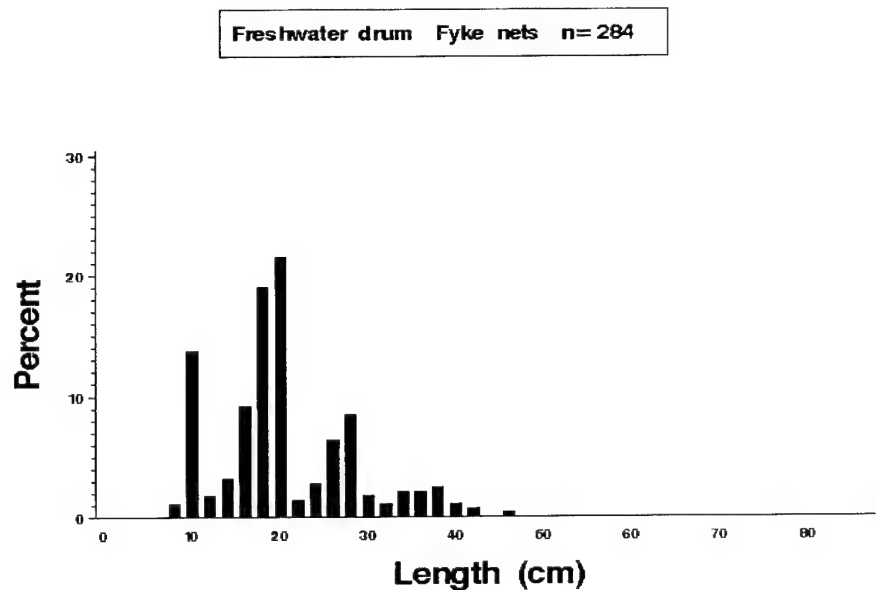


Figure 2.19. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 8 during 1995.

Chapter 3. Pool 13, Upper Mississippi River

by

Melvin C. Bowler

Iowa Department of Natural Resources
Mississippi River Monitoring Station
206 Rose Street
Bellevue, Iowa 52031

Hydrograph

For most of the sampling season, water levels remained nearly at or above the 54-year mean at the Lock and Dam 12 tailwater gage (Figure 3.1). During sampling, we encountered moderately high water levels midway through the second period (August 7–September 15), and again encountered moderately high water levels midway during the last half of the third period (October 9–October 31). Because of high water levels, we did not complete one sample by day electrofishing in the main channel border wing dam stratum during the second period and three samples by day electrofishing in the main channel border wing dam stratum during the third period. The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

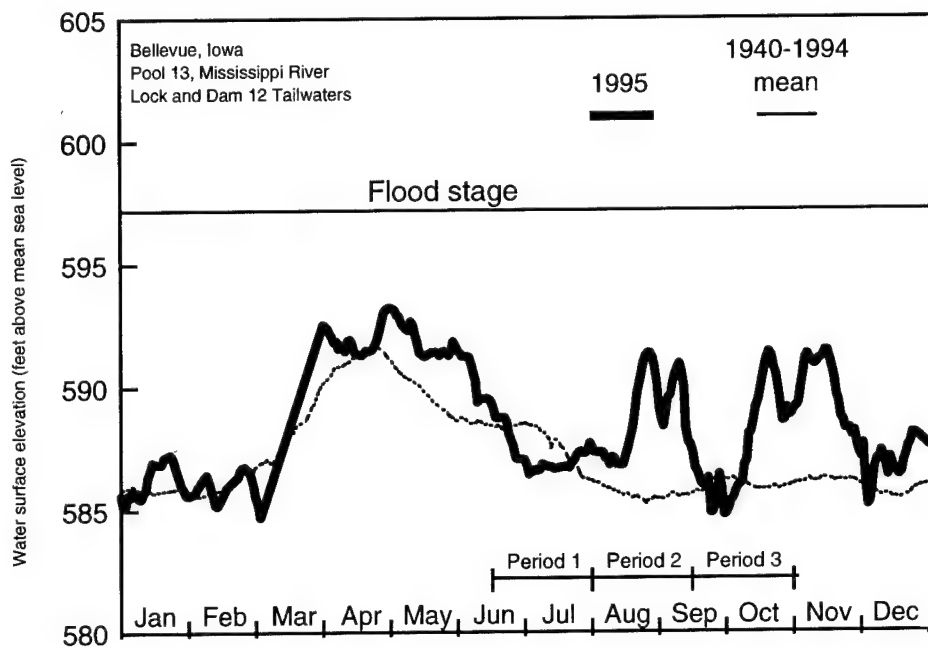


Figure 3.1. Daily water surface elevation from Lock and Dam 12 for Pool 13, Upper Mississippi River, during 1995 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

Summary of Sampling Effort

We sampled the fish population in Pool 13 in 1995 using 10 types of gear that were deployed among eight strata types. A total of 486 samples were allocated during the three periods and 482 samples were completed. Sampling effort was nearly uniform among all three periods. We completed 162 samples in the first period, 161 samples in the second period, and 159 samples in the third period (Table 3.1). Of the 482 samples collected, 434 were at stratified random sites and 48 were at fixed sites.

Total Catch by Gear

We collected a total of 49,894 fish represented by 61 species with no hybrids reported. The top five species collected with all gears combined were the emerald shiner (17,267), bluegill (5,921), river shiner (5,917), largemouth bass (3,813), and gizzard shad (3,274).

We collected 2,792 fish (49 species) by day electrofishing, 3,792 fish (43 species) by night electrofishing, 2,598 fish (31 species) by fyke netting, 1,679 fish (29 species) by tandem fyke netting, 9,628 fish (44 species) by mini fyke netting, 1,843 fish (35 species) by tandem mini fyke netting, 25,434 fish (42 species) by seining, 682 fish (21 species) by small hoop netting, 1,301 fish (23 species) by large hoop netting, and 145 fish (8 species) by trawling (Table 3.2).

We collected no Federal or State threatened or endangered fishes in 1995, however, we collected 38 pugnose minnows—this species is listed as being of special concern in Iowa. Other notable species we collected were 1 Mississippi silvery minnow, 1 suckermouth minnow, 6 fathead minnows, 94 quillback, 1 white sucker, 1 blue sucker, 13 silver redhorse, 7 stonecat, 1 brown trout, 22 smallmouth bass, and 2 slenderhead darters. These species are listed as uncommon, rare, or tributary strays in Pool 13 by Pitlo et al. (1995) and are infrequently encountered in Long Term Resource Monitoring Program sampling in Pool 13.

Random Sampling, Mean *C/f* by Gear and Stratum

Mean catch-per-unit-effort (*C/f*) of dominant fish species for random sampling by gear type and stratum is listed in Tables 3.3.1 to 3.3.9.

Day Electrofishing

Day electrofishing *C/f* (fish/15 min) was highest for bluegill (19.17) in the BWCS stratum, gizzard shad (7.33) in the IMPS stratum, common carp (14.50) in the MCBU stratum, emerald shiner (14.40) in the MCBW stratum, common carp (11.00) in the SCB stratum, and common carp (11.62) for all strata combined (Table 3.3.1).

Night Electrofishing

Night electrofishing *C/f* (fish/15 min) was highest for freshwater drum (21.50) in BWCS stratum, freshwater drum (19.83) in the MCBU stratum, freshwater drum (22.17) in the SCB stratum, and freshwater drum (21.03) for all strata combined (Table 3.3.2).

Fyke Net

Fyke netting *C/f* (fish per net-day) was highest for black crappie (15.30) in the BWCS stratum, pumpkinseed (21.50) in the IMPS stratum, and gizzard shad (14.81) for all strata combined (Table 3.3.3).

Tandem Fyke Net

Tandem fyke netting *C/f* (fish per net-day) was highest for black crappie (15.34) in the BWCO stratum, gizzard shad (4.02) in the IMPO stratum, and black crappie (6.76) for all strata combined (Table 3.3.4).

Mini Fyke Net

Mini fyke netting *C/f* (fish per net-day) was highest for bluegill (26.70) in the BWCS stratum, river shiner (96.90) in the IMPS stratum, emerald shiner (71.89) in the MCBU stratum, bluegill (79.64) in the MCBW stratum, emerald shiner (37.90) in the SCB stratum, and emerald shiner (38.33) for all strata combined (Table 3.3.5).

Tandem Mini Fyke Net

Tandem mini fyke netting *C/f* (fish per net-day) was highest for emerald shiner (20.20) in the BWCO stratum, freshwater drum (8.43) in the IMPO stratum, and freshwater drum (11.68) for all strata combined (Table 3.3.6).

Small Hoop Net

Small hoop netting *C/f* (fish per net-day) was highest for black crappie (0.88) in the BWCO stratum, freshwater drum (0.79) in the IMPO stratum, channel catfish (9.61) in the MCBU stratum, freshwater drum (0.62) in the MCBW stratum, channel catfish (3.69) in the SCB stratum, and channel catfish (2.48) for all strata combined (Table 3.3.7).

Large Hoop Net

Large hoop netting *C/f* (fish per net-day) was highest for common carp (2.29) in the BWCO stratum, smallmouth buffalo (2.08) in the IMPO stratum, smallmouth buffalo (3.19) in the MCBU stratum, smallmouth buffalo (0.69) in the MCBW stratum, smallmouth buffalo (1.61) in the SCB stratum, and smallmouth buffalo (2.12) for all strata combined (Table 3.3.8).

Seine

Seining *C/f* (fish per haul) was highest for largemouth bass (76.78) in the BWCS stratum, river shiner (84.04) in the IMPS stratum, emerald shiner (331.28) in the MCBU stratum, emerald shiner (85.58) in the SCB stratum, and emerald shiner (150.22) for all strata combined (Table 3.3.9).

Fixed Sampling, Mean *C/f* by Gear and Stratum

All fixed sampling was confined in the TWZ stratum using night electrofishing, mini fyke nets, small and large hoop nets, and trawls. Mean catch-per-unit-effort (*C/f*) of dominant fish species for fixed-site sampling by gear type is listed in Tables 3.4.1 to 3.4.5.

Night Electrofishing

Night electrofishing *C/f* (fish/15 min) was highest for white bass (75.67; Table 3.4.1)

Mini Fyke Net

Mini fyke netting *C/f* (fish per net-day) was highest for emerald shiner (115.09; Table 3.4.2).

Small Hoop Net

Small hoop netting *C/f* (fish per net-day) was highest for freshwater drum (3.72; Table 3.4.3).

Large Hoop Net

Large hoop netting *C/f* (fish per net-day) was highest for smallmouth buffalo (62.76; Table 3.4.4).

Trawl

Trawling *C/f* (fish per haul) was highest for freshwater drum (3.33; Table 3.4.5).

Length Distributions of Selected Species

Length distributions (expressed as a percentage of total catch for that species for various gears) for gizzard shad, common carp, smallmouth buffalo, channel catfish, northern pike, white bass, bluegill, largemouth bass, white crappie, black crappie, sauger, walleye, and freshwater drum are illustrated in Figures 3.2 to 3.17. Because data within a single sampling season are taken over a long time and size ranges for certain fish can overlap (e.g., a 6-cm-long bluegill collected early in period 1 is not of the same cohort as a 6-cm-long bluegill collected late in period 3), interpretations in the length distributions should be made cautiously. Length distributions from small samples ($n < 100$) may be included but are not statistically meaningful (Anderson and Neuman 1996).

Gizzard Shad

We collected 491 gizzard shad from day and night electrofishing with lengths ranging from 2.5 to 29.4 cm (Figure 3.2). Mean length was 16.9 cm, and peaks in the distribution occurred at 10 and 22 cm. Minimal numbers were collected from 14 to 20 cm. Twenty-five additional gizzard shad were grouped into a 4-cm-length category ranging from 26 to 30 cm. These fish were not included in the length–frequency analysis.

Common Carp

We collected 716 common carp from day and night electrofishing with lengths ranging from 5.8 to 82.0 cm (Figure 3.3). Mean length was 51.1 cm, and peak distribution occurred at 50 cm. Smaller peaks that probably represent different age classes occurred at 6 and 30 cm. Young-of-the-year fish (<1.4 cm) constituted a small fraction of total catch. No common carp were collected between 14 and 26 cm.

Smallmouth Buffalo

We collected 125 smallmouth buffalo from day and night electrofishing with lengths ranging from 8.6 to 68.0 cm (Figure 3.4). Mean length was 25.1 cm, and a peak in the distribution occurred at 18–20 cm. Three smallmouth buffalo were grouped into a 3-cm-length category from 23 to 26 cm, and 26 were grouped into a 3-cm-length category from 24 to 27 cm. These fish were not included in the length–frequency analysis. We also collected 932 smallmouth buffalo from small and large hoop netting with lengths ranging from 19.8 to 61.1 cm (Figure 3.5). Mean length was 27.3 cm, and a peak in the distribution occurred at 24 cm. A small number of smallmouth buffalo were clumped at 32–38 and 44–52 cm.

Channel Catfish

We collected 312 channel catfish from small and large hoop netting with lengths ranging from 7.2 to 58.1 cm (Figure 3.6). Mean length was 23.6 cm, and peak distributions occurred at 18 and 24 cm. Less than 4% were greater than 38.1 cm (>15 inches).

Northern Pike

We collected only 24 northern pike from fyke netting with lengths ranging from 39.3 to 89.5 cm (Figure 3.7). Mean length of the northern pike collected was 63.4 cm.

White Bass

We collected 635 white bass from day and night electrofishing with lengths ranging from 3.4 to 33.9 cm (Figure 3.8). Mean length was 16.4 cm, and a peak in the distribution occurred at 16 cm. Fish less than 14.0 cm long are probably age 0 and contributed to 28% of the total catch. About 5% were greater than 22.9 cm (>9 inches).

Bluegill

We collected 849 bluegill from day and night electrofishing with lengths ranging from 1.1 to 25.1 cm (Figure 3.9). Mean length was 10.1 cm, and peak distribution occurred at 12 cm. About 45% were less than 10 cm (<4 inches) and about 4% were greater than 15.2 cm (>6 inches). We also collected 649 bluegill from fyke netting with lengths ranging from 6.0 to 21.6 cm (Figure 3.10). Mean length was 12.1 cm, and peak distribution occurred at 8 cm. A small discernable peak occurred with fish clumped around 16–18 cm. About 22% were greater than 15.2 cm (>6 inches).

Largemouth Bass

We collected 502 largemouth bass from day and night electrofishing with lengths ranging from 3.9 to 44.2 cm (Figure 3.11). Mean length was 21.7 cm, and peak distributions occurred at 10 cm, with other peaks at 20 and 34 cm. Fish less than 12.0 cm are probably age 0 and contributed to 36% of the total catch. About 8% were greater than 35.5 cm (>14 inches).

White Crappie

We collected 168 white crappie from fyke netting with lengths ranging from 5.6 to 36.0 cm (Figure 3.12). Mean length was 20.9 cm, and peak distribution occurred at 18 cm. Smaller peaks occurred at 10 and 28 cm. About 43% were greater than 20.3 cm (>8 inches).

Black Crappie

We collected 933 black crappie from fyke netting with lengths ranging from 3.6 to 32.0 cm (Figure 3.13). One specimen, measured at 3.6 cm, was considered to be an outlier for this gear. Mean length was 16.2 cm, and peak distribution occurred at 14 cm. Smaller peaks occurred at 20 and 24 cm. About 20% were greater than 20.3 cm (>8 inches).

Sauger

We collected 184 sauger from day and night electrofishing with lengths ranging from 13.3 to 54.2 cm (Figure 3.14). Mean length was 23.7 cm, and peak distribution occurred at 24 cm. The majority of fish less than 23.0 cm are probably age 0 and contributed to 51% of the total catch. About 10% were greater than 30.5 cm (>12 inches).

Walleye

We collected 112 walleye from day and night electrofishing with lengths ranging from 8.5 to 58.2 cm (Figure 3.15). Mean length was 24.8 cm, and peak distribution occurred at 12–14 cm. Other peaks occurred at 24, 30, 42, and 54 cm. The majority of fish less than 23.0 cm are probably age 0 and contributed to 58% of the total catch. About 7% were greater than 38.1 cm (>15 inches).

Freshwater Drum

We collected 739 freshwater drum from day and night electrofishing with lengths ranging from 1.5 to 43.3 cm (Figure 3.16). Mean length was 15.7 cm, and peak distribution occurred at 18 cm. About 3% were greater than 30.5 cm (>12 inches). We also collected 256 freshwater drum from fyke netting with lengths ranging from 7.2 to 42.7 cm (Figure 3.17). Mean length was 16.7 cm, and peak distribution occurred at 12 cm. Smaller peaks that probably represent different age classes occurred at 30 and 40 cm. About 4% were greater than 30.5 cm (>12 inches).

Table 3.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in Pool 13 of the Mississippi River during 1995. Table entries are numbers of successfully completed standardized monitoring collections.

Table page: 1

Sampling period = 1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8		2	4	3	4				21
Fyke net	10					4				14
Large hoop net		5	2	4	3		2		2	18
Small hoop net		5	2	4	3		2		2	18
Mini fyke net	10		2	4	3	4			2	25
Night electrofishing	2		2	2					2	8
Seine	12		4	12		8				36
Trawling									8	8
Tandem fyke net		5					2			7
Tandem mini fyke net		5					2			7
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SUBTOTAL	42	20	14	30	12	20	8	0	16	162

Sampling period = 2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8		2	4	2	4				20
Fyke net	10					4				14
Large hoop net		5	2	4	3		2		2	18
Small hoop net		5	2	4	3		2		2	18
Mini fyke net	10		2	4	3	4			2	25
Night electrofishing	2		2	2					2	8
Seine	12		4	12		8				36
Trawling									8	8
Tandem fyke net		5					2			7
Tandem mini fyke net		5					2			7
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SUBTOTAL	42	20	14	30	11	20	8	0	16	161

Sampling period = 3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8		2	4		4				18
Fyke net	10					4				14
Large hoop net		5	2	4	3		2		2	18
Small hoop net		5	2	4	3		2		2	18
Mini fyke net	10		2	4	3	4			2	25
Night electrofishing	2		2	2					2	8
Seine	12		4	12		8				36
Trawling									8	8
Tandem fyke net		5					2			7
Tandem mini fyke net		5					2			7
	----	----	----	----	----	----	----	----	----	----
SUBTOTAL	42	20	14	30	9	20	8	0	16	159
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
	126	60	42	90	32	60	24	0	48	482

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SBU - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 13 of the Mississippi River. See Table 3.1 for the list of sampling gears actually deployed in this study reach.

Table page: 1

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Silver lamprey	Ichthyomyzon unicuspis	1	-	-	-	-	-	-	-	-	-	-	-	1
2	Shovelnose sturgeon	Scaphirhynchus platyrhynchus	-	-	-	-	-	-	-	-	-	-	-	36	36
3	Longnose gar	Lepisosteus osseus	2	3	9	6	1	1	-	-	1	-	-	-	23
4	Shortnose gar	Lepisosteus platostomus	2	5	131	24	38	3	6	1	5	-	-	-	215
5	Bowfin	Amia calva	6	-	27	4	17	-	1	-	1	-	-	-	56
6	Mooneye	Hiodon tergisus	1	7	-	2	-	-	-	-	-	-	-	-	10
7	Gizzard shad	Dorosoma cepedianum	298	218	601	343	942	139	712	2	18	-	-	1	3274
8	Spotfin shiner	Cyprinella spiloptera	23	5	-	-	47	2	17	-	-	-	-	-	94
9	Common carp	Cyprinus carpio	538	179	34	38	266	13	117	65	86	-	-	-	1336
10	Mississippi silvery minnow	Hybognathus nuchalis	1	-	-	-	-	-	-	-	-	-	-	-	1
11	Speckled chub	Macrhybopsis aestivalis	-	-	-	-	2	-	-	-	-	-	-	7	9
12	Silver chub	Macrhybopsis storeriana	8	36	-	-	2	1	13	-	-	-	-	4	64
13	Golden shiner	Notemigonus crysoleucas	6	2	7	21	42	4	13	1	-	-	-	-	96
14	Emerald shiner	Notropis atherinoides	296	489	-	-	2110	607	13765	-	-	-	-	-	17267
15	River shiner	Notropis bleinnius	64	52	-	-	2028	11	3762	-	-	-	-	-	5917
16	Spottail shiner	Notropis hudsonius	9	4	-	-	61	35	20	-	-	-	-	-	129
17	Channel shiner	Notropis wickliffi	8	30	-	-	425	8	438	-	-	-	-	-	909
18	Pugnose minnow	Opsopoeodus emiliae	-	-	-	-	24	6	8	-	-	-	-	-	38
19	Suckermouth minnow	Phenacobius mirabilis	-	-	-	-	-	-	1	-	-	-	-	-	1
20	Fathead minnow	Pimephales promelas	-	-	-	-	-	-	-	-	-	-	-	-	6
21	Bullhead minnow	Pimephales vigilax	23	17	-	-	152	7	407	-	-	-	-	-	606
22	River carpsucker	Carpionodes carpio	38	132	23	8	42	-	206	1	28	-	-	-	478
23	Quillback	Carpionodes cyprinus	4	74	1	10	2	-	2	-	1	-	-	-	94
24	Highfin carpsucker	Carpionodes velifer	13	49	6	-	8	-	1	-	2	-	-	-	79
25	White sucker	Catostomus commersoni	-	-	-	-	-	-	-	-	1	-	-	-	1
26	Blue sucker	Cycleptus elongatus	-	-	-	-	-	-	-	-	1	-	-	-	1
27	Smallmouth buffalo	Ictiobus bubalus	63	91	27	16	6	-	17	48	884	-	-	-	1152
28	Bigmouth buffalo	Ictiobus cyprinellus	13	11	1	4	1	1	-	1	2	-	-	-	34
29	Spotted sucker	Minytrema melanops	18	5	31	41	1	2	1	2	6	-	-	-	107
30	Silver redhorse	Moxostoma anisurum	5	8	-	-	-	-	-	-	-	-	-	-	13
31	Golden redhorse	Moxostoma erythrurum	4	17	-	-	-	-	1	-	-	-	-	-	22
32	Shorthead redhorse	Moxostoma macrolepidotum	25	246	14	16	22	4	62	3	8	-	-	-	400
33	Unidentified redhorse	Moxostoma sp.	-	-	-	-	1	-	-	-	-	-	-	-	1
34	Unidentified sucker	Catostomid sp.	-	-	-	-	6	-	-	-	-	-	-	-	6
35	Black bullhead	Ameiurus melas	-	-	-	1	10	-	-	-	-	-	-	-	11
36	Yellow bullhead	Ameiurus natalis	2	-	8	-	1	1	-	2	-	-	-	-	14
37	Channel catfish	Ictalurus punctatus	14	22	4	2	10	1	4	295	17	-	-	13	382
38	Stoner cat	Noturus flavus	4	-	-	-	-	-	-	-	-	-	-	3	7
39	Tadpole madtom	Noturus gyrinus	1	-	1	-	34	8	30	-	-	-	-	-	74

Gears: D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 3.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 13 of the Mississippi River. See Table 3.1 for the list of sampling gears actually deployed in this study reach.

Table page: 2

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Flathead catfish	Pylodictis olivaris	15	13	-	1	6	-	-	10	19	-	-	-	64
41	Northern pike	Esox lucius	4	4	18	6	11	-	6	-	-	-	-	-	49
42	Brown trout	Salmo trutta	-	-	-	-	-	1	-	-	-	-	-	-	1
43	Brook silverside	Labidesthes sicculus	2	4	-	-	48	-	75	-	-	-	-	-	129
44	White bass	Morone chrysops	93	542	151	189	94	14	155	9	29	-	-	1	1277
45	Yellow bass	Morone mississippiensis	3	9	2	3	-	-	-	-	-	-	-	-	17
46	Rock bass	Ambloplites rupestris	-	1	1	-	-	-	-	-	-	-	-	-	2
47	Pumpkinseed	Lepomis gibbosus	31	14	257	49	11	9	6	1	3	-	-	-	381
48	Warmouth	Lepomis gulosus	3	1	1	-	2	-	3	-	-	-	-	-	10
49	Orangespotted sunfish	Lepomis humilis	33	32	8	5	309	17	247	-	-	-	-	-	651
50	Bluegill	Lepomis macrochirus	527	322	511	138	1990	204	2165	46	18	-	-	-	5921
51	Smallmouth bass	Micropterus dolomieu	5	17	-	-	-	-	-	-	-	-	-	-	22
52	Largemouth bass	Micropterus salmoides	311	191	44	25	361	10	2867	-	4	-	-	-	3813
53	White crappie	Pomoxis annularis	35	11	95	73	29	61	16	11	9	-	-	-	340
54	Black crappie	Pomoxis nigromaculatus	66	44	481	454	104	35	18	41	20	-	-	-	1263
55	Mud darter	Etheostoma asprigene	1	-	-	-	23	2	7	-	-	-	-	-	33
56	Johnny darter	Etheostoma nigrum	1	1	-	-	23	5	74	-	-	-	-	-	104
57	Yellow perch	Perca flavescens	4	2	5	23	-	2	2	3	-	-	-	-	41
58	Logperch	Percina caprodes	14	1	-	-	34	16	28	-	-	-	-	-	93
59	Slenderhead darter	Percina phoxocephala	-	-	-	-	-	-	2	-	-	-	-	-	2
60	River darter	Percina shumardi	-	-	-	-	12	11	14	-	-	-	-	-	37
61	Sauger	Stizostedion canadense	25	159	4	4	3	-	2	2	-	-	-	-	199
62	Walleye	Stizostedion vitreum	10	102	4	8	5	2	2	1	-	-	-	-	134
63	Freshwater drum	Aplodinotus grunniens	119	620	91	165	269	594	141	137	138	-	-	80	2354
			=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
			2792	3792	2598	1679	9635	1843	25434	682	1301	0	0	145	49901

Gears: D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 3.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Silver lamprey	0.03 (0.03)					0.08 (0.08)				
Longnose gar					0.08 (0.08)		0.20 (0.20)			
Shortnose gar	0.03 (0.03)		0.08 (0.08)							
Bowfin	0.08 (0.03)		0.25 (0.09)							
Mooneye	0.04 (0.04)							0.17 (0.17)		
Gizzard shad	4.12 (1.09)		6.38 (2.40)		7.33 (2.51)	2.83 (1.75)	1.40 (1.17)	2.67 (1.38)		
Spotfin shiner	0.48 (0.21)		0.50 (0.42)			0.50 (0.36)	0.40 (0.24)	0.50 (0.34)		
Common carp	11.62 (1.54)		9.96 (2.16)		2.25 (1.30)	14.50 (3.43)	6.40 (4.59)	11.00 (1.97)		
Mississippi silvery minnow							0.20 (0.20)			
Silver chub	0.24 (0.14)		0.04 (0.04)		0.08 (0.08)	0.25 (0.18)		0.50 (0.50)		
Golden shiner	0.07 (0.03)		0.21 (0.10)		0.08 (0.08)					
Emerald shiner	4.87 (0.97)		4.04 (1.20)		2.25 (0.80)	6.42 (2.12)	14.40 (11.70)	3.83 (1.60)		
River shiner	1.45 (0.41)		0.46 (0.21)		1.00 (0.44)	2.00 (0.79)	1.00 (0.77)	2.00 (1.13)		
Spottail shiner	0.12 (0.07)		0.13 (0.09)		0.33 (0.19)	0.17 (0.17)				
Channel shiner	0.22 (0.10)		0.08 (0.08)		0.08 (0.08)	0.17 (0.11)		0.50 (0.34)		
Bullhead minnow	0.49 (0.25)		0.71 (0.40)					1.00 (0.82)		
River carpsucker	0.69 (0.17)		0.92 (0.31)		0.17 (0.17)	0.67 (0.28)	0.60 (0.60)	0.50 (0.34)		
Quillback	0.01 (0.01)				0.33 (0.33)					
Highfin carpsucker	0.15 (0.06)		0.17 (0.10)		0.50 (0.50)	0.08 (0.08)	0.20 (0.20)	0.17 (0.17)		
Smallmouth buffalo	1.00 (0.28)		1.88 (0.47)		0.08 (0.08)	0.42 (0.26)	1.40 (0.51)	0.83 (0.83)		
Bigmouth buffalo	0.11 (0.05)		0.29 (0.15)		0.17 (0.11)		0.80 (0.37)			
Spotted sucker	0.24 (0.12)		0.71 (0.35)		0.08 (0.08)					
Silver redhorse	0.01 (0.01)				0.42 (0.34)					
Golden redhorse	0.01 (0.01)				0.25 (0.18)		0.20 (0.20)			
Shorthead redhorse	0.30 (0.14)				0.42 (0.29)	0.17 (0.11)	2.60 (0.81)	0.83 (0.54)		
Yellow bullhead	0.03 (0.02)		0.08 (0.06)							
Channel catfish	0.17 (0.07)		0.21 (0.17)			0.25 (0.13)	1.20 (1.20)			
Stonecat							0.80 (0.80)			
Tadpole madtom	0.01 (0.01)		0.04 (0.04)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Flathead catfish	0.38 (0.12)		0.21 (0.10)			0.25 (0.13)	0.40 (0.40)	0.83 (0.40)		
Northern pike	0.16 (0.09)					0.08 (0.08)		0.50 (0.34)		
Brook silverside	0.04 (0.03)		0.04 (0.04)			0.08 (0.08)				
White bass	1.97 (0.39)		1.67 (0.50)		0.83 (0.24)	2.00 (0.56)	0.80 (0.49)	2.50 (1.15)		
Yellow bass	0.04 (0.02)		0.13 (0.07)							
Pumpkinseed	0.24 (0.07)		0.46 (0.15)		1.58 (1.00)	0.08 (0.08)				
Warmouth	0.04 (0.02)		0.13 (0.07)							
Orangespotted sunfish	0.46 (0.14)		1.38 (0.42)							
Bluegill	7.00 (1.44)		19.17 (4.31)		4.50 (1.65)	0.42 (0.19)	0.20 (0.20)	1.17 (0.54)		
Smallmouth bass	0.13 (0.09)						0.40 (0.40)	0.50 (0.34)		
Largemouth bass	4.38 (0.69)		7.67 (1.26)		7.08 (3.41)	1.50 (0.58)		4.00 (1.93)		
White crappie	0.49 (0.16)		1.46 (0.50)							
Black crappie	0.97 (0.23)		2.46 (0.61)			0.17 (0.17)	0.60 (0.40)	0.33 (0.33)		
Mud darter	0.01 (0.01)		0.04 (0.04)							
Johnny darter	0.01 (0.01)		0.04 (0.04)							
Yellow perch	0.03 (0.02)		0.08 (0.06)		0.17 (0.11)					
Logperch	0.09 (0.04)		0.08 (0.06)		0.75 (0.58)	0.08 (0.08)	0.40 (0.40)			
Sauger	0.58 (0.17)		0.54 (0.16)		0.08 (0.08)	0.17 (0.11)	0.20 (0.20)	1.33 (0.61)		
Walleye	0.15 (0.09)		0.17 (0.08)		0.33 (0.19)			0.33 (0.33)		
Freshwater drum	2.39 (0.47)		2.63 (0.94)		0.58 (0.29)	2.17 (0.84)	1.40 (0.68)	2.67 (0.61)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.12 (0.09)		0.17 (0.17)			0.17 (0.17)				
Shortnose gar	0.25 (0.15)		0.33 (0.21)			0.33 (0.33)				
Gizzard shad	6.16 (2.10)		4.67 (1.48)			9.67 (5.20)		3.00 (1.00)		
Spotfin shiner	0.20 (0.11)					0.17 (0.17)		0.50 (0.34)		
Common carp	9.24 (1.88)		11.67 (4.48)			6.67 (1.58)		9.83 (3.26)		
Silver chub	0.73 (0.28)		0.33 (0.21)			0.33 (0.33)		1.83 (0.91)		
Golden shiner	0.06 (0.06)					0.17 (0.17)				
Emerald shiner	5.88 (1.79)		3.50 (2.74)			5.67 (1.94)		9.33 (4.98)		
River shiner	1.12 (0.49)		0.67 (0.49)			1.83 (1.11)		0.67 (0.67)		
Spottail shiner	0.06 (0.06)					0.17 (0.17)				
Channel shiner	1.41 (0.64)		0.33 (0.21)			3.00 (1.63)		0.50 (0.34)		
Bullhead minnow	0.87 (0.31)		0.67 (0.49)			0.50 (0.22)		1.67 (0.92)		
River carpsucker	5.82 (2.24)		4.17 (2.80)			7.17 (4.76)		6.00 (3.04)		
Quillback	2.47 (0.89)		0.17 (0.17)			3.83 (1.49)		3.50 (2.54)		
Highfin carpsucker	2.43 (1.45)		0.17 (0.17)			6.00 (3.73)		0.17 (0.17)		
Smallmouth buffalo	1.54 (0.41)		2.00 (0.93)			1.17 (0.48)		1.50 (0.67)		
Bigmouth buffalo	0.44 (0.14)		0.50 (0.22)			0.33 (0.21)		0.50 (0.34)		
Spotted sucker	0.23 (0.17)		0.67 (0.49)							
Silver redhorse	0.30 (0.14)		0.17 (0.17)			0.17 (0.17)		0.67 (0.42)		
Golden redhorse	0.72 (0.32)		0.50 (0.22)			0.17 (0.17)		1.83 (1.14)		
Shorthead redhorse	7.53 (2.13)		5.83 (5.08)			5.67 (1.43)		12.50 (3.99)		
Channel catfish	0.59 (0.20)		0.33 (0.21)			1.00 (0.45)		0.33 (0.21)		
Flathead catfish	0.49 (0.16)		0.17 (0.17)			1.00 (0.37)		0.17 (0.17)		
Northern pike	0.10 (0.07)		0.17 (0.17)					0.17 (0.17)		
Brook silverside	0.17 (0.14)					0.33 (0.33)		0.17 (0.17)		
White bass	5.17 (0.88)		2.67 (0.99)			8.67 (1.71)		3.33 (1.78)		
Rock bass	0.04 (0.04)							0.17 (0.17)		
Pumpkinseed	0.22 (0.11)		0.33 (0.21)			0.17 (0.17)		0.17 (0.17)		
Warmouth	0.06 (0.06)		0.17 (0.17)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Orangespotted sunfish	1.34 (0.66)		3.33 (1.82)					0.67 (0.67)		
Bluegill	9.18 (2.21)		14.50 (4.97)			5.33 (2.46)		7.83 (3.81)		
Smallmouth bass	0.13 (0.09)							0.50 (0.34)		
Largemouth bass	4.18 (0.92)		4.50 (1.43)			3.67 (1.87)		4.50 (1.06)		
White crappie	0.32 (0.13)		0.67 (0.33)					0.33 (0.21)		
Black crappie	1.02 (0.32)		1.00 (0.52)			0.83 (0.54)		1.33 (0.61)		
Johnny darter	0.04 (0.04)							0.17 (0.17)		
Sauger	3.02 (0.64)		2.50 (1.15)			3.17 (0.70)		3.50 (1.57)		
Walleye	2.22 (0.74)		0.83 (0.48)			3.17 (1.76)		2.67 (0.92)		
Freshwater drum	21.03 (3.11)		21.50 (6.83)			19.83 (3.73)		22.17 (5.29)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.24 (0.10)		0.24 (0.11)		0.17 (0.12)					
Shortnose gar	3.92 (1.49)		4.22 (1.65)		1.08 (0.67)					
Bowfin	0.84 (0.22)		0.91 (0.24)		0.19 (0.19)					
Gizzard shad	14.81 (9.29)		14.84 (10.26)		14.49 (9.48)					
Common carp	0.81 (0.21)		0.79 (0.23)		1.01 (0.42)					
Golden shiner	0.08 (0.05)		0.04 (0.04)		0.53 (0.45)					
River carpsucker	0.58 (0.20)		0.58 (0.22)		0.60 (0.26)					
Quillback	0.01 (0.01)				0.08 (0.08)					
Highfin carpsucker	0.07 (0.05)		0.04 (0.04)		0.41 (0.33)					
Smallmouth buffalo	0.81 (0.24)		0.87 (0.26)		0.24 (0.17)					
Bigmouth buffalo	0.03 (0.03)		0.04 (0.04)							
Spotted sucker	1.00 (0.38)		1.10 (0.42)							
Shorthead redhorse	0.34 (0.23)		0.34 (0.26)		0.32 (0.22)					
Yellow bullhead	0.23 (0.09)		0.25 (0.10)		0.09 (0.09)					
Channel catfish	0.08 (0.07)		0.07 (0.07)		0.18 (0.12)					
Tadpole madtom	0.01 (0.01)				0.09 (0.09)					
Northern pike	0.57 (0.24)		0.62 (0.26)		0.09 (0.09)					
White bass	4.02 (1.48)		4.13 (1.64)		3.00 (1.03)					
Yellow bass	0.04 (0.03)		0.03 (0.03)		0.08 (0.08)					
Rock bass	0.03 (0.03)		0.04 (0.04)							
Pumpkinseed	2.18 (1.48)		0.14 (0.08)		21.50 (15.75)					
Warmouth	0.01 (0.01)				0.09 (0.09)					
Orangespotted sunfish	0.26 (0.14)		0.28 (0.16)							
Bluegill	12.68 (2.92)		12.57 (3.14)		13.72 (7.43)					
Largemouth bass	1.20 (0.25)		1.24 (0.27)		0.78 (0.46)					
White crappie	3.03 (0.72)		3.34 (0.80)		0.08 (0.08)					
Black crappie	14.31 (2.72)		15.30 (3.00)		4.86 (2.59)					
Yellow perch	0.04 (0.04)				0.43 (0.43)					
Sauger	0.12 (0.07)		0.14 (0.08)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Walleye	0.12 (0.07)		0.14 (0.08)							
Freshwater drum	2.43 (0.55)		2.51 (0.59)		1.63 (1.36)					

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.31 (0.19)	0.04 (0.04)		0.47 (0.30)						
Shortnose gar	0.63 (0.35)	0.59 (0.16)		0.65 (0.54)						
Bowfin	0.05 (0.03)	0.15 (0.08)								
Mooneye	0.06 (0.05)	0.03 (0.03)		0.08 (0.08)						
Gizzard shad	6.26 (1.51)	10.10 (2.85)		4.02 (1.73)						
Common carp	0.66 (0.14)	1.17 (0.34)		0.36 (0.11)						
Golden shiner	0.34 (0.13)	0.65 (0.29)		0.17 (0.10)						
River carpsucker	0.20 (0.13)	0.21 (0.10)		0.19 (0.19)						
Quillback	0.46 (0.42)	0.10 (0.06)		0.67 (0.67)						
Smallmouth buffalo	0.29 (0.09)	0.48 (0.15)		0.17 (0.11)						
Bigmouth buffalo	0.05 (0.02)	0.14 (0.06)								
Spotted sucker	0.53 (0.26)	1.45 (0.70)								
Shorthead redhorse	0.52 (0.28)	0.32 (0.14)		0.64 (0.44)						
Black bullhead	0.01 (0.01)	0.03 (0.03)								
Channel catfish	0.03 (0.03)	0.07 (0.07)								
Flathead catfish	0.01 (0.01)	0.03 (0.03)								
Northern pike	0.08 (0.05)	0.21 (0.14)								
White bass	3.88 (0.90)	5.34 (1.68)		3.03 (1.03)						
Yellow bass	0.04 (0.03)	0.11 (0.08)								
Pumpkinseed	1.99 (1.42)	0.50 (0.27)		2.85 (2.24)						
Orangespotted sunfish	0.07 (0.02)	0.18 (0.07)								
Bluegill	2.28 (0.46)	4.43 (0.96)		1.02 (0.47)						
Largemouth bass	0.49 (0.19)	0.72 (0.22)		0.36 (0.27)						
White crappie	1.07 (0.36)	2.50 (0.88)		0.24 (0.24)						
Black crappie	6.76 (1.90)	15.34 (4.88)		1.77 (0.97)						
Yellow perch	0.50 (0.28)	0.63 (0.21)		0.42 (0.42)						
Sauger	0.15 (0.12)	0.07 (0.05)		0.19 (0.19)						
Walleye	0.14 (0.08)	0.25 (0.15)		0.08 (0.08)						
Freshwater drum	3.08 (0.84)	4.91 (1.94)		2.02 (0.71)						

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.03 (0.03)					0.09 (0.09)				
Shortnose gar	0.34 (0.10)		0.50 (0.15)		1.54 (0.72)	0.19 (0.19)	0.35 (0.35)	0.16 (0.16)		
Bowfin	0.18 (0.08)		0.32 (0.13)		0.17 (0.17)	0.18 (0.18)	0.23 (0.15)			
Gizzard shad	11.01 (7.11)		1.34 (1.03)			14.32 (14.32)	72.42 (48.88)	18.95 (18.53)		
Spotfin shiner	0.91 (0.66)		0.14 (0.11)		0.41 (0.41)	2.14 (1.76)	1.15 (0.78)	0.19 (0.19)		
Common carp	1.68 (0.77)		2.45 (1.71)		14.90 (12.84)	0.81 (0.71)	0.49 (0.37)	0.16 (0.16)		
Silver chub	0.03 (0.03)					0.09 (0.09)	0.11 (0.11)			
Golden shiner	0.40 (0.13)		0.78 (0.31)			0.35 (0.24)	1.60 (1.07)			
Emerald shiner	38.33 (16.80)		5.15 (1.93)		5.71 (3.20)	71.89 (41.42)	12.04 (10.89)	37.90 (26.57)		
River shiner	27.38 (10.20)		1.82 (0.94)		96.90 (63.00)	56.69 (26.51)	9.26 (4.10)	8.78 (6.02)		
Spottail shiner	0.67 (0.38)		0.34 (0.19)		1.90 (1.42)	1.31 (1.01)	0.58 (0.45)			
Channel shiner	10.57 (4.35)		4.34 (3.62)		1.06 (0.49)	16.65 (8.96)	2.32 (0.97)	11.34 (10.01)		
Pugnose minnow	0.20 (0.15)		0.52 (0.46)		0.77 (0.60)					
Bullhead minnow	2.08 (0.53)		3.52 (1.21)		0.17 (0.12)	1.93 (0.91)	1.11 (0.59)	0.70 (0.34)		
River carpsucker	0.27 (0.12)				1.87 (1.20)	0.27 (0.19)	1.74 (1.04)	0.35 (0.35)		
Quillback							0.25 (0.25)			
Highfin carpsucker	0.28 (0.28)					0.75 (0.75)				
Smallmouth buffalo	0.05 (0.03)		0.14 (0.08)				0.23 (0.15)			
Bigmouth buffalo	0.01 (0.01)		0.03 (0.03)							
Spotted sucker	0.01 (0.01)		0.03 (0.03)							
Shorthead redhorse	0.02 (0.01)						2.72 (2.72)			
Black bullhead	0.38 (0.27)					0.54 (0.54)		0.70 (0.70)		
Yellow bullhead	0.01 (0.01)		0.04 (0.04)							
Channel catfish	0.27 (0.15)				0.08 (0.08)	0.70 (0.39)	0.11 (0.11)			
Tadpole madtom	0.40 (0.29)		0.92 (0.86)		0.25 (0.25)	0.09 (0.09)	0.12 (0.12)	0.19 (0.19)		
Flathead catfish	0.01 (0.01)		0.03 (0.03)							
Northern pike	0.26 (0.12)		0.21 (0.09)			0.26 (0.18)		0.38 (0.38)		
Brook silverside	0.29 (0.14)		0.18 (0.15)		3.28 (2.84)	0.18 (0.18)		0.18 (0.18)		
White bass	1.03 (0.31)		0.24 (0.15)		1.21 (0.72)	1.58 (0.68)	2.85 (1.39)	1.18 (0.65)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Pumpkinseed	0.16 (0.07)		0.10 (0.10)		0.42 (0.33)	0.18 (0.12)		0.19 (0.19)		
Warmouth	0.02 (0.02)		0.07 (0.05)							
Orangespotted sunfish	3.53 (1.05)		10.39 (3.16)		0.08 (0.08)	0.18 (0.12)	0.23 (0.23)			
Bluegill	24.71 (8.21)		26.70 (8.20)		6.83 (3.60)	22.76 (15.53)	79.64 (53.13)	26.18 (20.33)		
Largemouth bass	5.26 (2.15)		10.62 (6.03)		0.44 (0.20)	2.38 (1.29)	2.11 (1.17)	3.16 (2.42)		
White crappie	0.28 (0.11)		0.68 (0.31)				0.69 (0.45)	0.18 (0.18)		
Black crappie	1.13 (0.33)		2.73 (0.93)		0.35 (0.20)	0.26 (0.26)	1.52 (0.72)	0.38 (0.24)		
Mud darter	0.51 (0.31)		0.03 (0.03)		0.17 (0.11)	0.96 (0.79)	0.45 (0.45)	0.54 (0.36)		
Johnny darter	0.25 (0.11)		0.54 (0.25)		0.17 (0.12)	0.17 (0.17)	0.34 (0.34)			
Logperch	0.72 (0.47)		0.14 (0.08)		0.09 (0.09)	0.59 (0.41)	1.37 (0.75)	1.75 (1.75)		
River darter	0.17 (0.09)		0.18 (0.11)			0.18 (0.18)	0.48 (0.26)	0.18 (0.18)		
Sauger	0.01 (0.01)		0.03 (0.03)				0.11 (0.11)			
Walleye	0.09 (0.07)		0.03 (0.03)		0.17 (0.11)	0.19 (0.19)				
Freshwater drum	3.44 (2.07)		0.54 (0.27)		7.75 (7.18)	6.37 (5.49)	6.25 (3.95)	2.31 (0.91)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.01 (0.01)	0.03 (0.03)								
Shortnose gar	0.04 (0.02)	0.10 (0.05)								
Gizzard shad	1.97 (1.10)	4.51 (2.95)		0.49 (0.25)						
Spotfin shiner	0.06 (0.05)	0.04 (0.04)		0.08 (0.08)						
Common carp	0.24 (0.12)	0.38 (0.16)		0.16 (0.16)						
Silver chub	0.05 (0.05)			0.09 (0.09)						
Golden shiner	0.09 (0.07)	0.10 (0.10)		0.09 (0.09)						
Emerald shiner	8.15 (4.13)	20.20 (11.17)		1.14 (0.72)						
River shiner	0.21 (0.13)	0.31 (0.24)		0.16 (0.16)						
Spottail shiner	1.19 (0.37)	0.54 (0.27)		1.57 (0.56)						
Channel shiner	0.14 (0.07)	0.24 (0.12)		0.08 (0.08)						
Pugnose minnow	0.08 (0.04)	0.21 (0.10)								
Fathead minnow	0.11 (0.07)	0.17 (0.12)		0.08 (0.08)						
Bullhead minnow	0.09 (0.06)	0.24 (0.17)								
Bigmouth buffalo	0.01 (0.01)	0.03 (0.03)								
Spotted sucker	0.06 (0.05)	0.03 (0.03)		0.08 (0.08)						
Shorthead redhorse	0.13 (0.07)	0.07 (0.07)		0.16 (0.10)						
Yellow bullhead	0.01 (0.01)	0.04 (0.04)								
Channel catfish	0.05 (0.05)			0.09 (0.09)						
Tadpole madtom	0.14 (0.07)	0.24 (0.12)		0.08 (0.08)						
Brown trout	0.01 (0.01)	0.04 (0.04)								
White bass	0.49 (0.16)	0.21 (0.09)		0.66 (0.24)						
Pumpkinseed	0.32 (0.13)	0.14 (0.08)		0.43 (0.21)						
Orangespotted sunfish	0.23 (0.13)	0.61 (0.36)								
Bluegill	2.83 (0.99)	6.95 (2.66)		0.43 (0.28)						
Largemouth bass	0.17 (0.07)	0.32 (0.11)		0.08 (0.08)						
White crappie	0.80 (0.40)	2.17 (1.08)								
Black crappie	0.61 (0.26)	1.09 (0.41)		0.34 (0.34)						
Mud darter	0.02 (0.02)	0.07 (0.05)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Johnny darter	0.06 (0.03)	0.17 (0.08)								
Yellow perch	0.03 (0.02)	0.07 (0.05)								
Logperch	0.20 (0.08)	0.55 (0.23)								
River darter	0.47 (0.43)	0.11 (0.08)		0.67 (0.67)						
Walleye	0.02 (0.02)	0.07 (0.05)								
Freshwater drum	11.68 (6.32)	17.26 (15.54)		8.43 (4.27)						

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.01 (0.01)	0.03 (0.03)								
Gizzard shad	0.02 (0.01)	0.07 (0.05)								
Common carp	0.13 (0.08)	0.53 (0.34)					0.11 (0.11)			
Golden shiner	0.01 (0.01)	0.03 (0.03)								
Smallmouth buffalo	0.23 (0.10)	0.60 (0.39)				0.17 (0.10)		0.34 (0.25)		
Bigmouth buffalo	0.01 (0.01)	0.03 (0.03)								
Spotted sucker	0.02 (0.01)	0.07 (0.05)								
Shorthead redhorse	0.03 (0.02)					0.04 (0.04)		0.18 (0.11)		
Yellow bullhead	0.02 (0.01)	0.04 (0.04)						0.08 (0.08)		
Channel catfish	2.48 (1.08)	0.45 (0.17)		0.17 (0.11)		9.61 (5.38)	0.45 (0.25)	3.69 (2.79)		
Flathead catfish	0.03 (0.02)	0.04 (0.04)				0.04 (0.04)	0.17 (0.09)	0.09 (0.09)		
White bass	0.09 (0.04)	0.14 (0.06)		0.08 (0.08)		0.13 (0.07)				
Pumpkinseed	0.01 (0.01)	0.03 (0.03)								
Bluegill	0.46 (0.20)	0.71 (0.23)		0.25 (0.17)		0.04 (0.04)	0.06 (0.06)	1.34 (1.34)		
White crappie	0.10 (0.05)	0.25 (0.16)						0.27 (0.27)		
Black crappie	0.42 (0.18)	0.88 (0.57)		0.25 (0.17)				0.67 (0.67)		
Yellow perch	0.03 (0.01)	0.10 (0.05)								
Sauger	0.01 (0.01)						0.06 (0.06)	0.08 (0.08)		
Walleye	0.01 (0.01)	0.03 (0.03)								
Freshwater drum	1.00 (0.35)	0.46 (0.27)		0.79 (0.69)		2.13 (0.79)	0.62 (0.39)	1.08 (0.79)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.01 (0.01)	0.04 (0.04)								
Shortnose gar	0.04 (0.02)	0.14 (0.08)				0.04 (0.04)				
Bowfin	0.01 (0.01)	0.04 (0.04)								
Gizzard shad	0.25 (0.09)	0.46 (0.22)		0.25 (0.17)				0.18 (0.18)		
Common carp	0.65 (0.30)	2.29 (1.18)		0.08 (0.08)				0.34 (0.17)		
River carpsucker	0.06 (0.04)					0.21 (0.17)	0.12 (0.12)	0.17 (0.17)		
Quillback	0.04 (0.04)			0.09 (0.09)						
Highfin carpsucker	0.01 (0.01)	0.04 (0.04)								
White sucker	0.01 (0.01)	0.04 (0.04)								
Blue sucker							0.06 (0.06)			
Smallmouth buffalo	2.12 (0.64)	1.67 (0.85)		2.08 (1.29)		3.19 (1.20)	0.69 (0.51)	1.61 (0.45)		
Bigmouth buffalo	0.04 (0.04)			0.08 (0.08)						
Spotted sucker	0.05 (0.02)	0.21 (0.10)								
Shorthead redhorse	0.08 (0.04)	0.14 (0.06)		0.08 (0.08)		0.04 (0.04)	0.06 (0.06)			
Channel catfish	0.15 (0.06)	0.21 (0.15)		0.08 (0.08)		0.27 (0.15)		0.09 (0.09)		
Flathead catfish	0.01 (0.01)	0.04 (0.04)					0.17 (0.09)			
White bass	0.43 (0.15)	0.47 (0.26)		0.59 (0.30)		0.31 (0.23)				
Pumpkinseed	0.02 (0.02)	0.10 (0.07)								
Bluegill	0.15 (0.10)	0.61 (0.40)								
Largemouth bass	0.03 (0.02)	0.13 (0.08)								
White crappie	0.07 (0.03)	0.28 (0.13)								
Black crappie	0.15 (0.08)	0.54 (0.33)						0.09 (0.09)		
Freshwater drum	0.46 (0.10)	0.29 (0.21)		0.42 (0.15)		0.71 (0.19)	0.18 (0.12)	0.52 (0.33)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.03 (0.02)		0.06 (0.06)		0.13 (0.09)	0.03 (0.03)				
Bowfin	0.01 (0.01)		0.03 (0.03)							
Gizzard shad	6.49 (4.01)		16.58 (11.95)		1.71 (0.67)	1.81 (0.98)		0.75 (0.49)		
Spotfin shiner	0.29 (0.12)					0.19 (0.10)		0.83 (0.46)		
Common carp	0.28 (0.10)		0.17 (0.10)		4.42 (2.49)	0.11 (0.07)		0.08 (0.08)		
Silver chub	0.16 (0.06)		0.08 (0.08)			0.19 (0.10)		0.25 (0.13)		
Golden shiner	0.03 (0.02)		0.06 (0.04)		0.46 (0.42)					
Emerald shiner	150.22 (76.42)		11.61 (3.00)		16.42 (5.03)	331.28 (203.39)		85.58 (39.13)		
River shiner	21.97 (7.27)		3.17 (1.72)		84.04 (34.43)	42.78 (19.13)		7.58 (2.34)		
Spottail shiner	0.25 (0.11)		0.28 (0.09)		0.04 (0.04)	0.08 (0.06)		0.50 (0.42)		
Channel shiner	4.81 (1.33)		4.97 (2.53)		0.92 (0.52)	4.92 (1.48)		5.00 (3.39)		
Pugnose minnow	0.07 (0.04)		0.22 (0.11)							
Suckermouth minnow	0.01 (0.01)					0.03 (0.03)				
Bullhead minnow	5.29 (1.27)		6.81 (3.01)		0.04 (0.04)	1.06 (0.23)		10.25 (3.07)		
River carpsucker	0.91 (0.41)		0.36 (0.18)		5.79 (2.73)	1.44 (1.06)		0.17 (0.11)		
Quillback	0.02 (0.02)		0.06 (0.06)							
Highfin carpsucker	0.01 (0.01)		0.03 (0.03)							
Smallmouth buffalo	0.16 (0.11)		0.11 (0.07)		0.04 (0.04)	0.33 (0.28)				
Spotted sucker	0.01 (0.01)		0.03 (0.03)							
Golden redhorse					0.04 (0.04)					
Shorthead redhorse	0.78 (0.30)		0.31 (0.12)		0.04 (0.04)	1.00 (0.69)		1.17 (0.56)		
Channel catfish	0.04 (0.02)					0.11 (0.07)				
Tadpole madtom	0.18 (0.06)		0.36 (0.14)		0.58 (0.35)	0.06 (0.06)		0.08 (0.08)		
Northern pike	0.07 (0.04)		0.14 (0.10)					0.08 (0.08)		
Brook silverside	0.31 (0.10)		0.64 (0.29)		2.08 (0.90)	0.06 (0.04)				
White bass	1.61 (0.74)		2.36 (2.13)		0.21 (0.08)	1.47 (0.49)		1.00 (0.37)		
Pumpkinseed	0.02 (0.01)		0.03 (0.03)		0.21 (0.17)					
Warmouth	0.03 (0.02)		0.08 (0.05)							
Orangespotted sunfish	2.44 (1.20)		6.50 (3.55)		0.04 (0.04)			1.00 (0.66)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 13 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Bluegill	19.05 (4.12)		51.11 (12.11)		8.13 (3.04)	2.92 (2.05)		2.08 (0.99)		
Largemouth bass	26.35 (18.61)		76.78 (55.73)		2.88 (0.68)	0.56 (0.27)		1.17 (0.42)		
White crappie	0.15 (0.07)		0.33 (0.20)			0.11 (0.07)				
Black crappie	0.16 (0.04)		0.39 (0.11)		0.04 (0.04)	0.08 (0.06)				
Mud darter	0.08 (0.05)		0.17 (0.14)					0.08 (0.08)		
Johnny darter	0.66 (0.18)		1.17 (0.49)		0.79 (0.57)	0.08 (0.06)		0.83 (0.24)		
Yellow perch	0.02 (0.01)		0.06 (0.04)							
Logperch	0.33 (0.13)		0.31 (0.12)		0.21 (0.13)	0.08 (0.06)		0.75 (0.46)		
Slenderhead darter	0.02 (0.02)		0.06 (0.06)							
River darter	0.13 (0.05)		0.39 (0.16)							
Sauger	0.02 (0.01)		0.06 (0.04)							
Walleye	0.03 (0.02)					0.03 (0.03)		0.08 (0.08)		
Freshwater drum	1.30 (0.51)		0.64 (0.26)		0.88 (0.64)	2.58 (1.35)		0.33 (0.19)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 13 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar									0.17 (0.17)
Shortnose gar									0.17 (0.17)
Mooneye									1.17 (1.17)
Gizzard shad									19.00 (6.87)
Spotfin shiner									0.17 (0.17)
Common carp									1.67 (0.67)
Silver chub									3.50 (2.20)
Golden shiner									0.17 (0.17)
Emerald shiner									63.00 (55.21)
River shiner									5.50 (4.21)
Spottail shiner									0.50 (0.50)
Channel shiner									1.17 (0.65)
River carpsucker									4.67 (1.78)
Quillback									4.83 (2.65)
Highfin carpsucker									1.83 (1.01)
Smallmouth buffalo									10.50 (5.34)
Bigmouth buffalo									0.50 (0.34)
Spotted sucker									0.17 (0.17)
Silver redhorse									0.33 (0.33)
Golden redhorse									0.33 (0.21)
Shorthead redhorse									17.00 (8.56)
Channel catfish									2.00 (1.03)
Flathead catfish									0.83 (0.40)
Northern pike									0.33 (0.21)
Brook silverside									0.17 (0.17)
White bass									75.67 (26.80)
Yellow bass									1.50 (0.96)
Pumpkinseed									1.67 (1.31)
Orangespotted sunfish									1.33 (0.80)
Bluegill									26.00 (10.17)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 13 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Smallmouth bass									2.33 (0.67)
Largemouth bass									19.17 (7.29)
White crappie									0.83 (0.65)
Black crappie									4.17 (2.12)
Yellow perch									0.33 (0.33)
Logperch									0.17 (0.17)
Sauger									17.33 (4.31)
Walleye									10.33 (2.70)
Freshwater drum									39.83 (19.76)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 13 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Bowfin									0.35 (0.35)
Gizzard shad									0.19 (0.19)
Spotfin shiner									0.16 (0.16)
Common carp									1.46 (0.92)
Speckled chub									0.33 (0.33)
Golden shiner									0.18 (0.18)
Emerald shiner									115.09 (113.26)
River shiner									16.63 (14.17)
Spottail shiner									1.49 (1.28)
Channel shiner									1.62 (0.81)
Bullhead minnow									2.20 (0.96)
River carpsucker									0.16 (0.16)
Flathead catfish									0.84 (0.47)
White bass									4.06 (2.34)
Bluegill									3.90 (1.39)
Largemouth bass									0.92 (0.53)
White crappie									0.36 (0.23)
Black crappie									0.49 (0.33)
Mud darter									0.37 (0.37)
Johnny darter									0.18 (0.18)
Sauger									0.16 (0.16)
Freshwater drum									5.30 (2.06)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 13 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Common carp									4.04 (2.33)
River carpsucker									0.09 (0.09)
Smallmouth buffalo									2.05 (1.16)
Channel catfish									1.79 (1.34)
Flathead catfish									0.34 (0.17)
White bass									0.09 (0.09)
Bluegill									0.43 (0.43)
White crappie									0.09 (0.09)
Black crappie									0.35 (0.35)
Freshwater drum									3.72 (2.53)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 13 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Common carp									1.37 (0.70)
River carpsucker									1.65 (0.97)
Highfin carpsucker									0.09 (0.09)
Smallmouth buffalo									62.76 (38.91)
Bigmouth buffalo									0.09 (0.09)
Shorthead redhorse									0.09 (0.09)
Channel catfish									0.26 (0.11)
Flathead catfish									1.27 (0.62)
White bass									0.17 (0.17)
White crappie									0.09 (0.09)
Black crappie									0.34 (0.25)
Freshwater drum									8.48 (6.58)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 3.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in Pool 13 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shovelnose sturgeon									1.50 (0.71)
Gizzard shad									0.04 (0.04)
Speckled chub									0.29 (0.18)
Silver chub									0.17 (0.17)
Channel catfish									0.54 (0.27)
Stonecat									0.13 (0.07)
White bass									0.04 (0.04)
Freshwater drum									3.33 (1.70)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

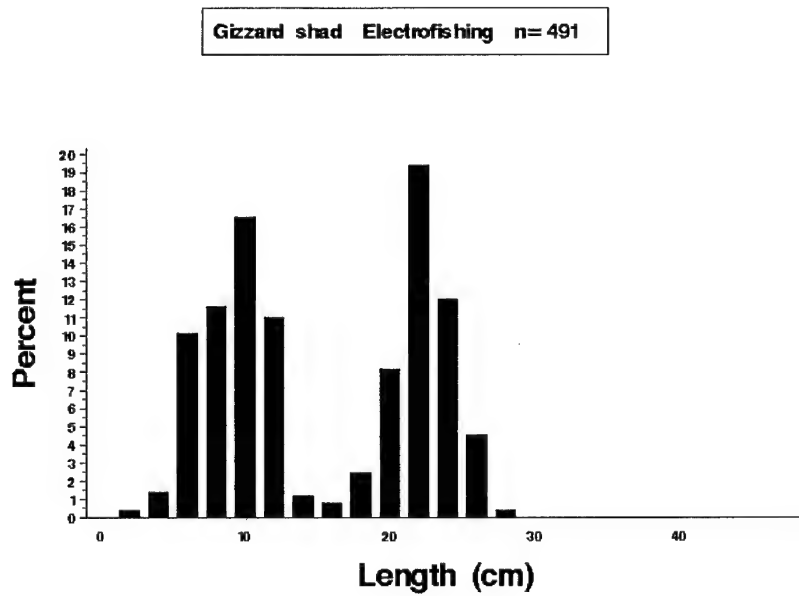


Figure 3.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

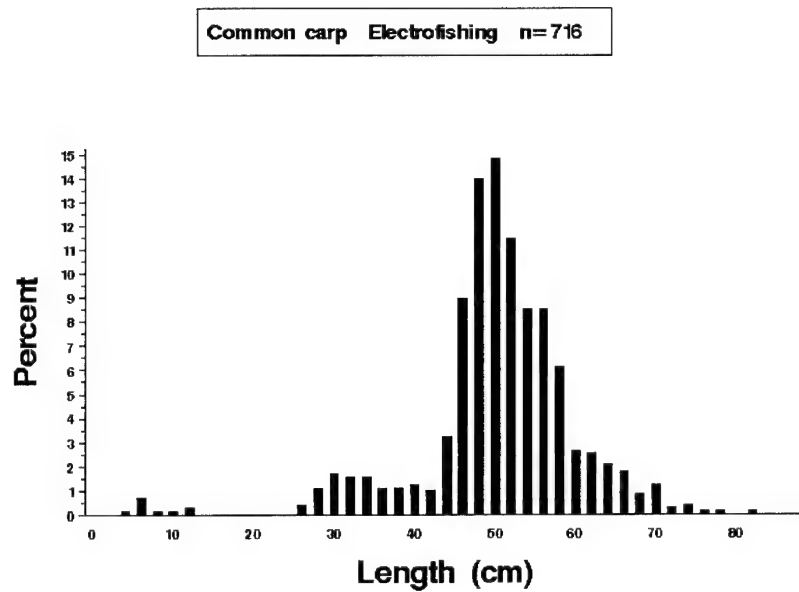


Figure 3.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

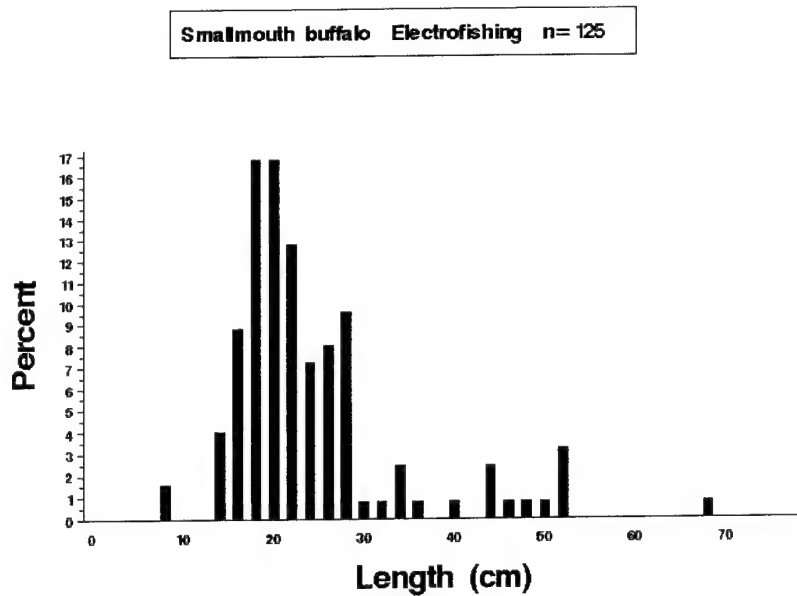


Figure 3.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

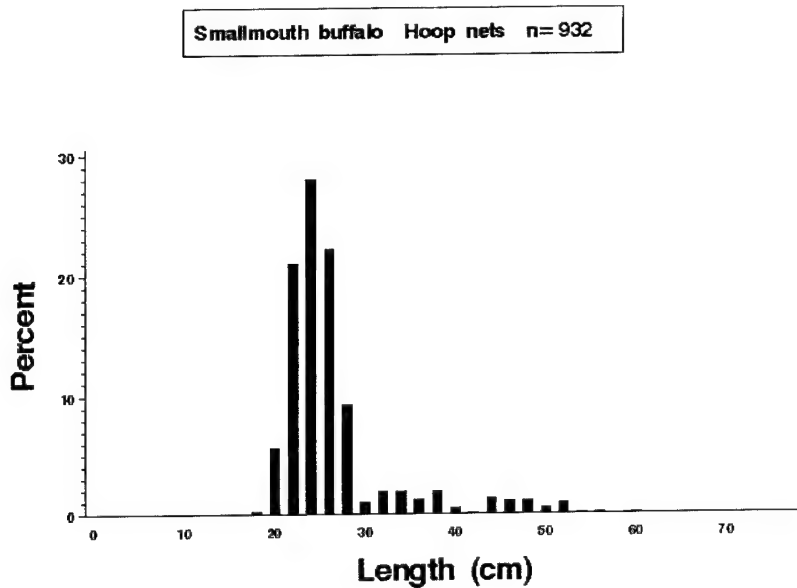


Figure 3.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by large and small hoop netting in Upper Mississippi River Pool 13 during 1995.

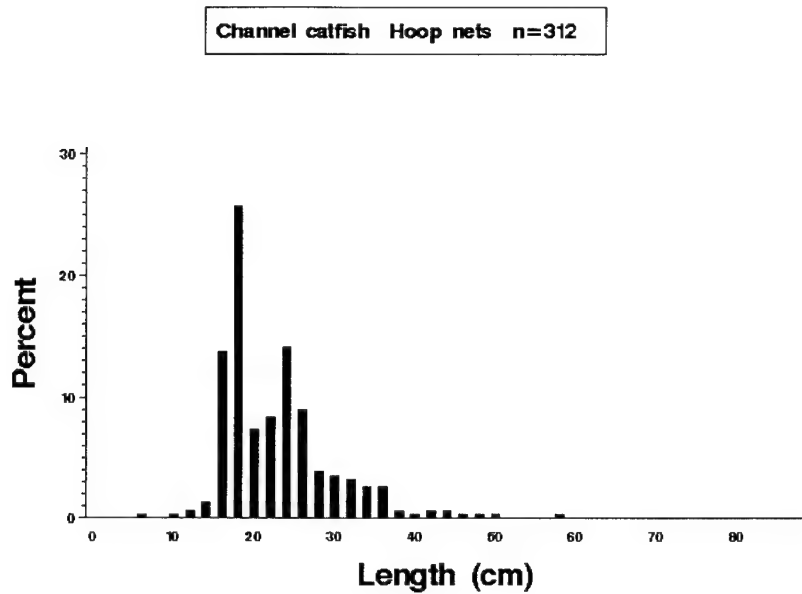


Figure 3.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by large and small hoop netting in Upper Mississippi River Pool 13 during 1995.

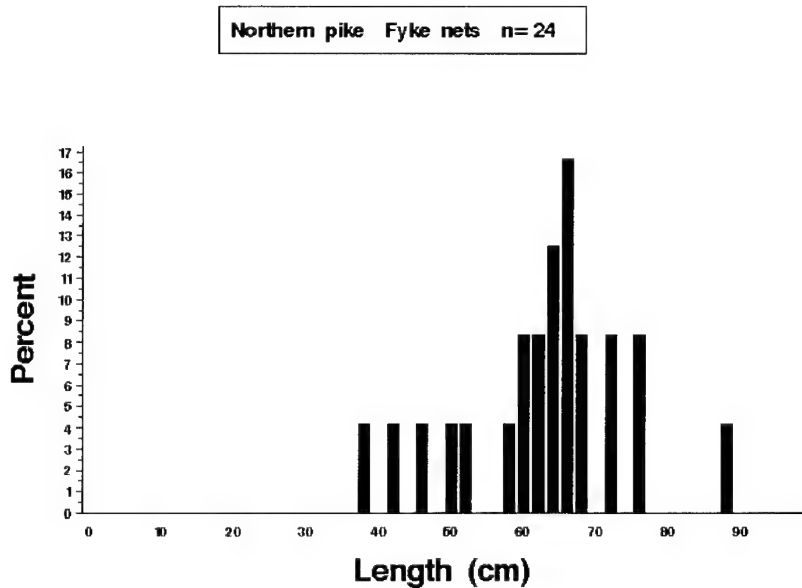


Figure 3.7. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 13 during 1995.

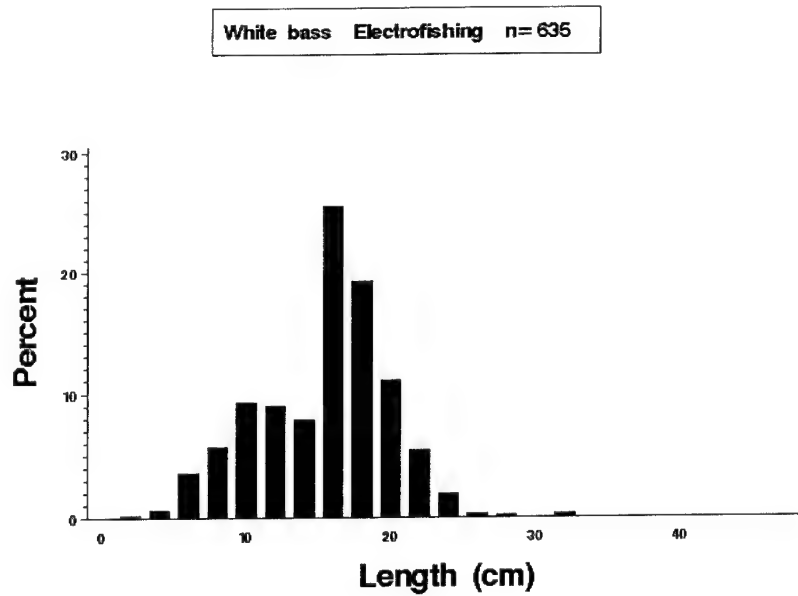


Figure 3.8. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

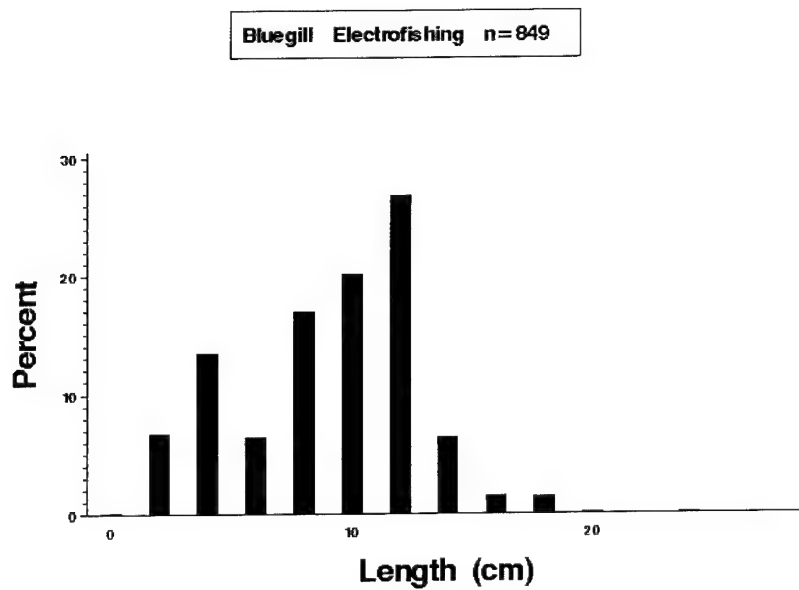


Figure 3.9. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

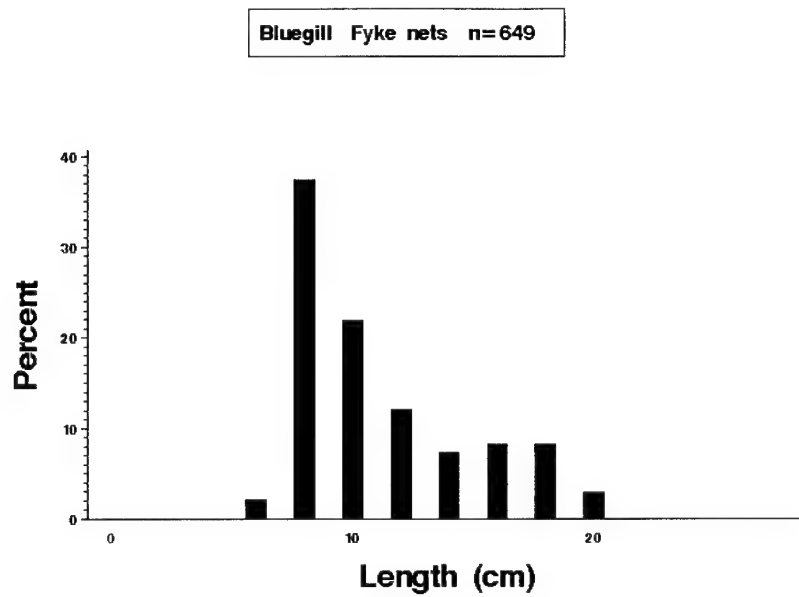


Figure 3.10. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 13 during 1995.

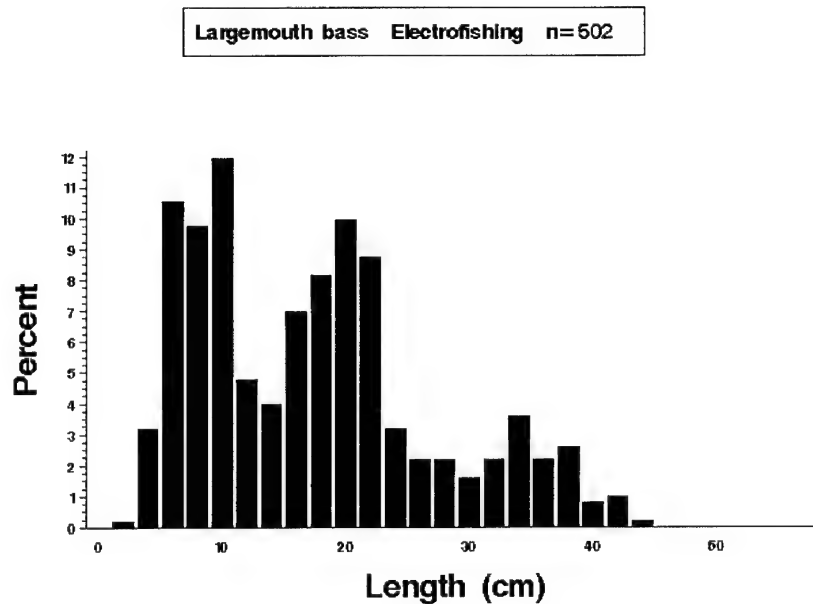


Figure 3.11. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

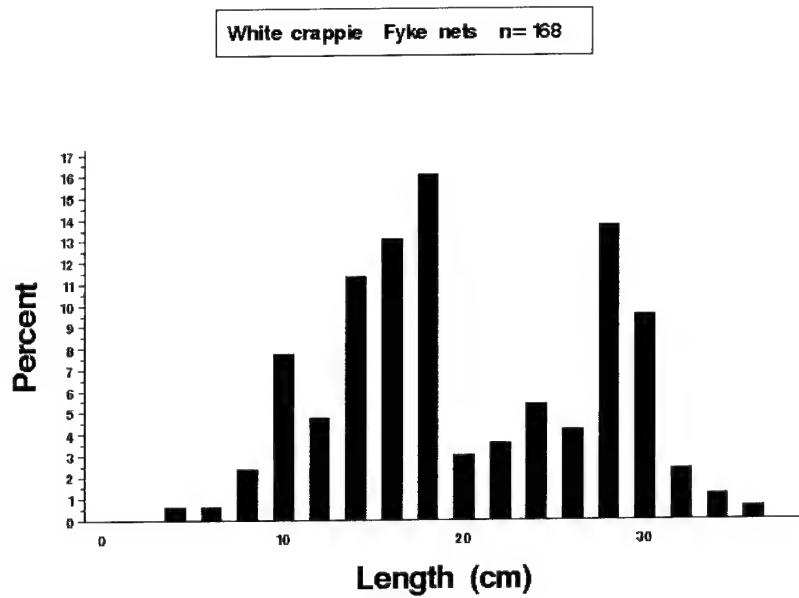


Figure 3.12. Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularis*) collected by fyke netting in Upper Mississippi River Pool 13 during 1995.

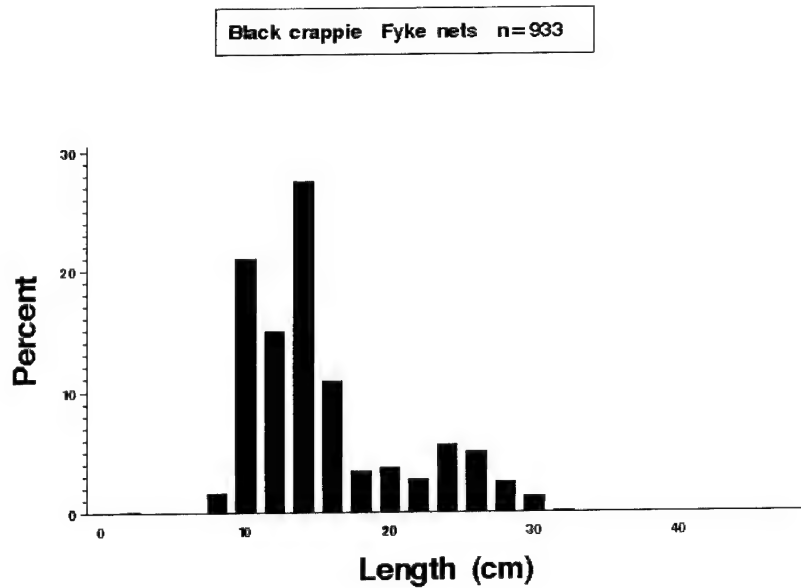


Figure 3.13. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Upper Mississippi River Pool 13 during 1995.

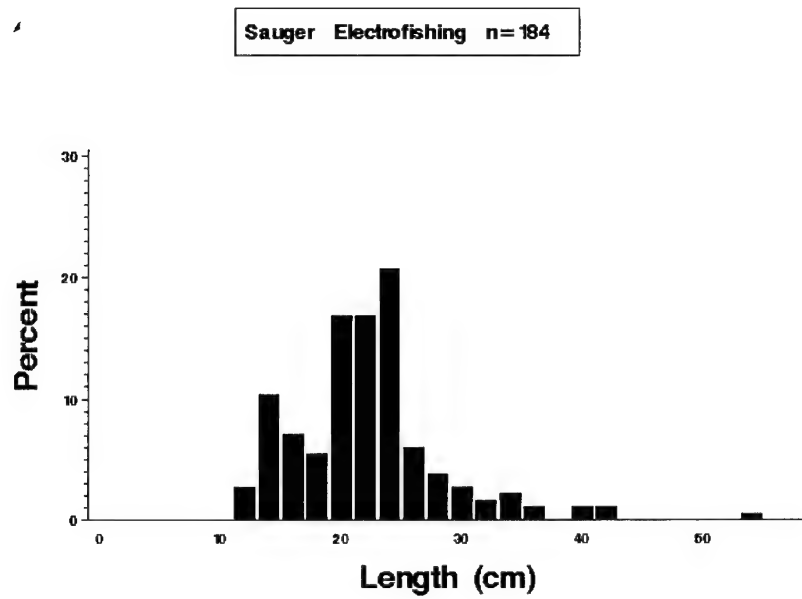


Figure 3.14. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

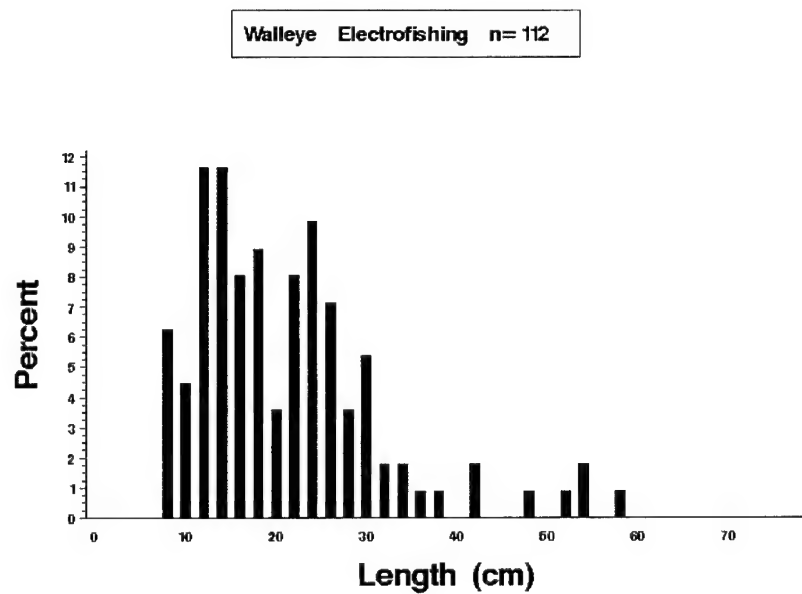


Figure 3.15. Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

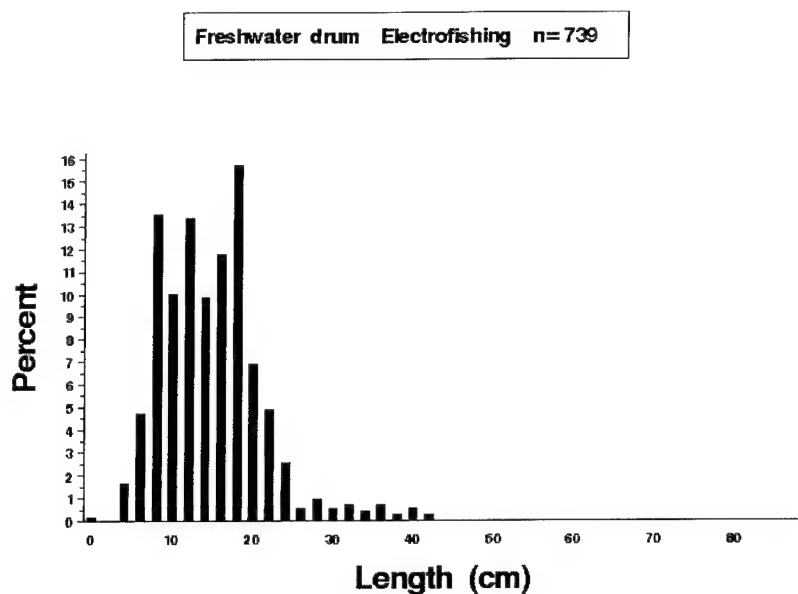


Figure 3.16. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 13 during 1995.

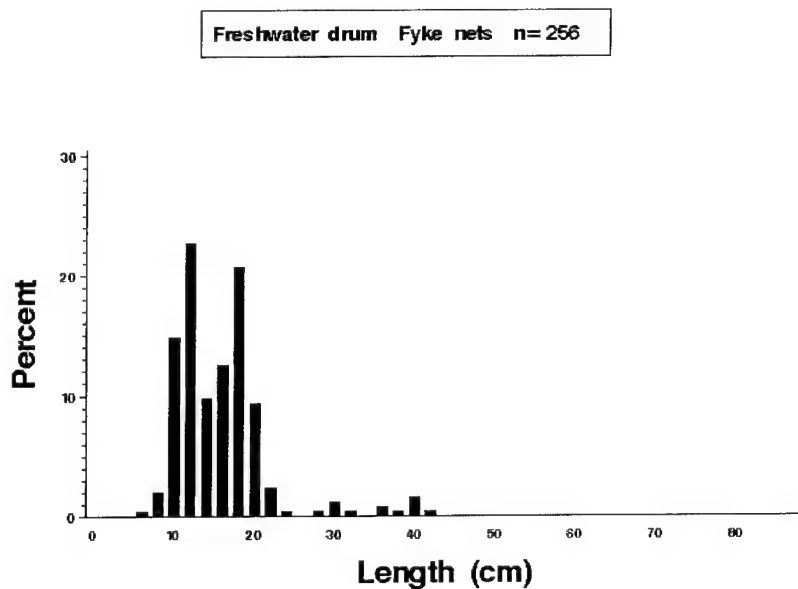


Figure 3.17. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 13 during 1995.

Chapter 4. Pool 26, Upper Mississippi River

by

Frederick A. Cronin and Dirk W. Soergel

Illinois Natural History Survey
Alton Field Station
4134 Alby Street
Alton, Illinois 62002

Hydrograph

Water levels at Pool 26 are influenced by discharge from the Mississippi, Illinois, and Missouri Rivers. The pool is regulated at a midpool control point by the U.S. Army Corps of Engineers. These factors combine to give Pool 26 a highly fluctuating hydrologic regime. Three sets of hydrographs are shown to accurately represent these fluctuations (Figure 4.1). Gages are located at Lock and Dam 25 tailwater (Winfield Gage), midpool (Grafton Gage), and Lock and Dam 26 impoundment (Alton Gage). Each graph shows 1940–94 daily means and 1995 daily water levels. The Winfield Gage shows 1995 daily fluctuations above and below the mean and a significant flood pulse beginning in April, peaking in May, and receding in June just before the 1995 sampling season. The Grafton Gage shows 1995 daily water levels near the mean until March and April when water levels were low, then a significant flood pulse in May and June. The Alton Gage shows a similar pattern but with low water in April and again in June and July. Discharge data were obtained from the U.S. Army Corps of Engineers, St. Louis District.

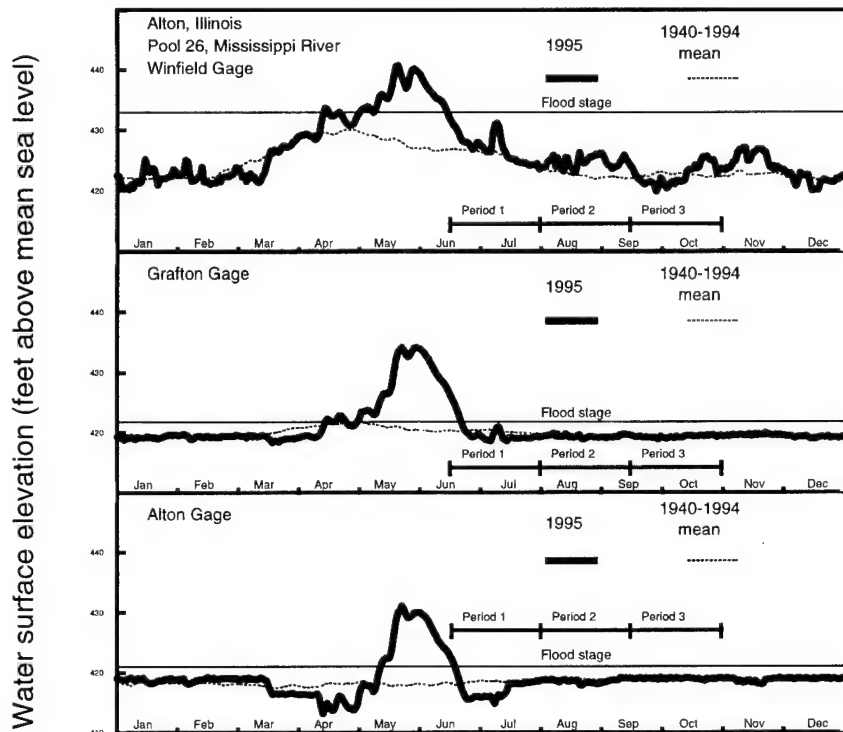


Figure 4.1. Daily water surface elevation from Winfield, Grafton, and Alton Gages for Pool 26, Upper Mississippi River, during 1995 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers, St. Louis District.

Summary of Sampling Effort

We collected 383 samples in 1995, 127 in period 1, 128 in period 2, and 128 in period 3 (Table 4.1). Of those, 365 were from randomly selected sites in the BWCS, BWCO, SCB, MCBU, MCBW, IMPS, and IMPO strata, and 18 were from fixed sites in the TWZ stratum.

Total Catch by Gear

We collected 29,282 fish representing 70 species and 1 hybrid cross (Table 4.2) during the 1995 field season. The five most abundant species numerically were the gizzard shad (15,089), common carp (2,298), freshwater drum (1,504), emerald shiner (1,251), and smallmouth buffalo (1,023). The total number of fish and species (excluding hybrids) collected by gear type were day electrofishing, 11,237 fish of 51 species; night electrofishing, 1,192 fish of 29 species; fyke nets, 1,339 fish of 29 species; tandem fyke nets, 549 fish of 23 species; mini fyke nets, 4,002 fish of 50 species; tandem mini fyke nets, 2,044 fish of 23 species; seines, 7,067 fish of 39 species; small hoop nets, 729 fish of 14 species; large hoop nets, 1,092 fish of 19 species; and trawls, 31 fish of 6 species. Two species were collected in 1995 that were not previously collected in LTRMP samples (Gutreuter 1992). These species were the northern pike and the Mississippi silvery minnow.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

For day electrofishing (Table 4.3.1), gizzard shad had the highest catch-per-unit-effort (*C/f*) in all strata combined (71.50), followed by common carp (16.73) and freshwater drum (5.12). Gizzard shad also had the highest *C/f* in the BWCS (200.33), IMPS (106.59), MCBU (70.38), and SCB (55.11) strata. Common carp had the highest *C/f* in the MCBW (50.00). The second and third highest *C/f* by stratum were BWCS (common carp, 8.33; smallmouth buffalo, 5.89), IMPS (bluegill, 11.68; smallmouth buffalo, 9.06), MCBU (common carp, 15.75; freshwater drum, 5.42), MCBW (gizzard shad, 24.50; smallmouth buffalo, 6.33), and SCB (common carp, 20.56; freshwater drum, 4.67).

Fyke Net

For fyke netting (Table 4.3.2), black crappie had the highest *C/f* in all strata combined (3.61), followed by bluegill (3.58) and shortnose gar (2.65). Black crappie had the highest *C/f* in the BWCS stratum (18.99), followed by bluegill (18.13) and shortnose gar (15.33). Bluegill had the highest *C/f* in the IMPS stratum (30.23), followed by black crappie (23.16) and common carp (3.59). Gizzard shad had the highest *C/f* in the SCB stratum (2.17), followed by freshwater drum (1.04) and shortnose gar (0.86).

Tandem Fyke Net

For tandem fyke netting (Table 4.3.3), gizzard shad had the highest *C/f* in all strata combined (6.22), followed by black crappie (3.47) and shortnose gar (3.12). Gizzard shad had the highest *C/f* in the BWCO stratum (11.26), followed by shortnose gar (7.21) and white bass (2.09). Black crappie had the highest *C/f* in the IMPO stratum (4.60), followed by bluegill (3.71) and gizzard shad (2.69).

Mini Fyke Net

For mini fyke netting (Table 4.3.4), gizzard shad had the highest *C/f* in all strata combined (18.23), followed by western mosquitofish (5.09) and emerald shiner (4.87). Gizzard shad also had the highest *C/f* in the BWCS (105.63), IMPS (40.86), MCBU (10.08), and SCB strata (24.33). Emerald shiner had the highest

C/f in the MCBW stratum (14.31). The second and third highest *C/fs* by stratum were BWCS (western mosquitofish, 63.34; shortnose gar, 4.39), IMPS (white bass, 15.43; bluegill, 7.16), MCBU (smallmouth buffalo, 6.84; emerald shiner, 6.42), MCBW (spotfin shiner, 5.07; bluegill, 4.62), and SCB (freshwater drum, 9.39; bluegill, 2.80).

Tandem Mini Fyke Net

For tandem mini fyke netting (Table 4.3.5), gizzard shad had the highest *C/f* in all strata combined (42.19), followed by freshwater drum (14.41) and white bass (5.21). The three highest *C/fs* by stratum were BWCO (gizzard shad, 74.71; emerald shiner, 3.40; freshwater drum, 2.79) and IMPO (freshwater drum, 22.54; gizzard shad, 19.44; white bass, 7.37).

Small Hoop Net

For small hoop netting (Table 4.3.6), channel catfish had the highest *C/f* in all strata combined (6.03), followed by common carp (1.66) and smallmouth buffalo (0.41). The three highest *C/fs* by stratum were BWCO (common carp, 4.23; river carpsucker, 0.25; black buffalo, 0.17), IMPO (common carp, 1.62; channel catfish, 0.58; brown bullhead, 0.42), MCBU (channel catfish, 5.62; common carp, 1.74; smallmouth buffalo, 0.58), MCBW (common carp, 1.19; freshwater drum, 0.17; black buffalo, 0.17), and SCB (channel catfish, 7.85; common carp, 1.34; freshwater drum, 0.06; flathead catfish, 0.06).

Large Hoop Net

For large hoop netting (Table 4.3.7), common carp had the highest *C/f* in all strata combined (5.22), followed by smallmouth buffalo (4.50) and freshwater drum (0.87). Common carp also had the highest *C/f* in the BWCO (6.42), IMPO (2.83), MCBU (5.57), MCBW (3.70), and SCB (4.56) strata. The second and third highest *C/fs* by stratum were BWCO (gizzard shad, 1.36; goldeye, 1.11), IMPO (smallmouth buffalo, 0.93; gizzard shad, 0.25; river carpsucker, 0.25; white bass, 0.25; black crappie, 0.25), MCBU (smallmouth buffalo, 5.20; freshwater drum, 1.26), MCBW (freshwater drum, 2.61; black buffalo, 0.86), and SCB (smallmouth buffalo, 3.42; channel catfish, 0.41).

Seine

For seining (Table 4.3.8), gizzard shad had the highest *C/f* in all strata combined (46.38), followed by emerald shiner (8.47) and river shiner (7.20). Gizzard shad also had the highest *C/f* in the MCBU (53.85) and SCB (28.97) strata. The second and third highest *C/fs* by stratum were MCBU (river shiner, 7.31; emerald shiner, 6.54) and SCB (emerald shiner, 12.97; channel shiner, 10.72).

Fixed Sampling, Mean *C/f* by Gear and Stratum

Night Electrofishing

The only stratum sampled by night electrofishing was the TWZ (Table 4.4.1). Gizzard shad had the highest *C/f* (60.40), followed by common carp (38.00) and white bass (27.40).

Trawl

The only stratum sampled by trawling was also the TWZ (Table 4.4.2). Shovelnose sturgeon and channel catfish both had the highest C/f (0.83), followed by freshwater drum (0.50) and blue catfish (0.25).

Length Distributions of Selected Species

Length distributions are presented for selected species in Figures 4.2 to 4.14. The length distributions for some gears may be limited by the size selectiveness of the particular gear. Length distributions from small samples ($n < 100$) may be included but are not statistically meaningful (Anderson and Neumann 1996).

Gizzard Shad

The electrofishing length distribution from 7,997 gizzard shad (Figure 4.2) is characterized by two length groups. The first probably represents age 0 fish from 2 to 10 cm, and the second are larger fish from 14 to 30 cm.

Common Carp

The electrofishing length distribution from 1,450 common carp (Figure 4.3) shows a mode of 34 cm, a group of age 0 fish between zero and 10 cm, and many larger fish between 40 and 80 cm.

Smallmouth Buffalo

The electrofishing length distribution from 496 smallmouth buffalo (Figure 4.4) appears bimodal, with a length group of age 0 fish (mode of 4 cm) and a length group of larger fish (mode of 24 cm). The hoop net length distribution from 379 smallmouth buffalo (Figure 4.5) shows mostly larger fish with a mode of 30 cm and more fish above the mode than below it.

Channel Catfish

The electrofishing length distribution from 161 channel catfish (Figure 4.6) shows multiple length groups. The group between zero and 10 cm probably represent age 0 fish. The other groups are vague within a range of 14 to 64 cm, with a mode of 46 cm. The hoop net length distribution from 490 channel catfish (Figure 4.7) shows a very strong length group, with a mode of 20 cm and more fish above the mode than below it.

White Bass

The electrofishing length distribution from 284 white bass (Figure 4.8) appears bimodal, with a mode at 10 cm and a mode at 26 cm.

Bluegill

The electrofishing length distribution from 276 bluegill (Figure 4.9) shows fish ranging from zero to 18 cm, with no clear length groups. The fyke net length distribution from 454 bluegill (Figure 4.10) shows a high percent of the total in the 14- and 16-cm-length groups.

Largemouth Bass

The electrofishing length distribution from 72 largemouth bass (Figure 4.11) has a mode of 28 cm, with length groups vaguely defined.

Black Crappie

The fyke netting length distribution from 446 black crappie (Figure 4.12) is characterized by an even distribution, with a mode of 18 cm.

Sauger

The electrofishing length distribution from 67 sauger (Figure 4.13) shows fish ranging from 4 to 42 cm, with no clear length groups.

Freshwater Drum

The electrofishing length distribution from 406 freshwater drum (Figure 4.14) appears bimodal. The first group has a mode at 6 cm and probably represents age 0 fish. The larger group has a mode at 22 cm, with fish present to 50 cm.

Table 4.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in Pool 26 of the Mississippi River during 1995. Table entries are numbers of successfully completed standardized monitoring collections.

Table page: 1

Sampling period = 1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	6		6	7	2	4				25
Fyke net	4		2			2				8
Large hoop net		2	5	7	2		2			18
Small hoop net		2	5	8	2		2			19
Mini fyke net	4		5	2	2	2				15
Night electrofishing									2	2
Seine			12	16						28
Trawling									4	4
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
	----	----	---	----	----	----	----	---	---	-----
SUBTOTAL	14	8	35	40	8	8	8	0	6	127

Sampling period = 2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	6		6	8	2	4				26
Fyke net	4		2			2				8
Large hoop net		2	5	8	2		2			19
Small hoop net		2	5	7	2		2			18
Mini fyke net	4		5	2	2	2				15
Night electrofishing									2	2
Seine			12	16						28
Trawling									4	4
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
	----	----	---	----	----	----	----	---	---	-----
SUBTOTAL	14	8	35	41	8	8	8	0	6	128

Sampling period = 3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	6		6	8	2	4				26
Fyke net	4		2			2				8
Large hoop net		2	5	8	2		2			19
Small hoop net		2	5	7	2		2			18
Mini fyke net	4		5	2	2	2				15
Night electrofishing									2	2
Seine			12	16						28
Trawling									4	4
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
	----	----	---	----	----	----	----	---	---	-----
SUBTOTAL	14	8	35	41	8	8	8	0	6	128
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
	42	24	105	122	24	24	24	0	18	383

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SBU - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 26 of the Mississippi River. See Table 4.1 for the list of sampling gears actually deployed in this study reach.

Table page: 1

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Silver lamprey	Ichthyomyzon unicuspis	1	-	-	-	-	-	-	-	-	-	-	-	1
2	Lake sturgeon	Acipenser fulvescens	-	-	-	-	-	-	-	-	-	-	-	1	1
3	Shovelnose sturgeon	Scaphirhynchus platyrhynchus	-	-	-	-	-	-	-	-	-	-	-	10	10
4	Spottted gar	Lepisosteus oculatus	1	-	8	-	1	-	-	-	-	-	-	-	10
5	Longnose gar	Lepisosteus osseus	6	3	-	-	3	-	-	-	-	-	-	-	12
6	Shortnose gar	Lepisosteus platostomus	85	54	203	91	74	34	4	-	1	-	-	-	546
7	Bowfin	Amia calva	5	-	15	2	2	-	-	-	-	-	-	-	24
8	Goldeye	Hiodon alosoides	126	9	-	3	3	-	43	-	14	-	-	-	198
9	Mooneye	Hiodon tergisus	41	-	-	-	1	-	59	-	-	-	-	-	101
10	American eel	Anguilla rostrata	1	-	-	-	-	-	-	-	-	-	-	-	1
11	Skipjack herring	Alosa chrysochloris	37	1	-	1	2	2	84	-	2	-	-	-	129
12	Gizzard shad	Dorosoma cepedianum	7620	377	33	171	1881	1356	3628	1	22	-	-	-	15089
13	Threadfin shad	Dorosoma petenense	1	-	-	-	-	-	-	-	-	-	-	-	1
14	Central stoneroller	Camptostoma anomalum	1	-	-	-	-	-	-	-	-	-	-	-	1
15	Goldfish	Carassius auratus	-	-	-	-	-	-	-	-	1	-	-	-	1
16	Grass carp	Ctenopharyngodon idella	-	1	-	-	-	-	-	-	-	-	-	-	1
17	Red shiner	Cyprinella lutrensis	1	-	-	-	11	-	73	-	-	-	-	-	85
18	Spotfin shiner	Cyprinella spiloptera	30	1	-	-	92	-	208	-	-	-	-	-	331
19	Common carp	Cyprinus carpio	1226	224	59	17	27	14	54	191	485	-	-	1	2298
20	Goldfish x carp	Carassius auratus x C. carpio	-	-	3	-	-	-	-	-	-	-	-	-	3
21	Mississippi silvery minnow	Hybognathus nuchalis	-	-	-	-	1	-	3	-	-	-	-	-	4
22	Bighead carp	Hypophthalmichthys nobilis	-	-	-	-	2	-	-	-	2	-	-	-	4
23	Speckled chub	Macrhybopsis aestivalis	-	-	-	-	2	4	3	-	-	-	-	-	9
24	Silver chub	Macrhybopsis storeriana	8	-	-	-	1	12	9	-	-	-	-	-	30
25	Golden shiner	Notemigonus crysoleucas	6	-	-	-	2	1	3	-	-	-	-	-	12
26	Emerald shiner	Notropis atherinoides	225	17	-	-	186	42	781	-	-	-	-	-	1251
27	River shiner	Notropis biennis	22	1	-	-	17	-	601	-	-	-	-	-	641
28	Spottail shiner	Notropis hudsonius	-	-	-	-	2	-	2	-	-	-	-	-	4
29	Silverband shiner	Notropis shumardi	-	-	-	-	53	14	-	-	-	-	-	-	67
30	Sand shiner	Notropis stramineus	2	-	-	-	7	-	11	-	-	-	-	-	20
31	Channel shiner	Notropis wickliffi	6	1	-	-	50	-	503	-	-	-	-	-	560
32	Suckermouth minnow	Phenacobius mirabilis	-	-	-	-	1	-	8	-	-	-	-	-	9
33	Bluntnose minnow	Pimephales notatus	1	-	-	-	3	-	-	-	-	-	-	-	4
34	Bullhead minnow	Pimephales vigilax	40	-	-	-	54	9	32	-	-	-	-	-	135
35	River carpsucker	Carpoides carpio	93	16	46	9	1	2	116	4	8	-	-	-	295
36	Quillback	Carpoides cyprinus	3	-	-	-	-	-	1	-	-	-	-	-	4
37	Blue sucker	Cycleptus elongatus	1	-	-	-	-	-	-	-	-	-	-	-	1
38	Smallmouth buffalo	Ictiobus bubalus	374	122	14	9	90	18	17	28	351	-	-	-	1023
39	Bigmouth buffalo	Ictiobus cyprinellus	53	12	9	1	3	4	-	-	5	-	-	-	87

Gears: D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 4.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in Pool 26 of the Mississippi River. See Table 4.1 for the list of sampling gears actually deployed in this study reach. Table page: 2

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Black buffalo	Ictiobus niger	24	4	4	7	-	2	-	6	16	-	-	-	63
41	Golden rehorse	Moxostoma erythrurum	-	-	-	-	-	-	1	-	-	-	-	-	1
42	Shorthead rehorse	Moxostoma macrolepidotum	19	7	3	2	1	-	-	-	-	-	-	-	32
43	Black bullhead	Ameiurus melas	1	-	9	1	2	1	-	-	-	-	-	-	14
44	Yellow bullhead	Ameiurus natalis	-	-	5	1	3	-	-	-	-	-	-	-	9
45	Brown bullhead	Ameiurus nebulosus	-	-	3	-	-	-	-	5	-	-	-	-	8
46	Blue catfish	Ictalurus furcatus	-	-	-	-	-	-	-	4	8	-	-	3	15
47	Channel catfish	Ictalurus punctatus	158	3	10	9	44	36	144	461	29	-	-	10	904
48	Tadpole madtom	Noturus gyrinus	-	-	-	-	1	-	-	-	-	-	-	-	1
49	Flathead catfish	Pylodictis olivaris	83	4	7	3	3	-	2	8	18	-	-	-	128
50	Northern pike	Esox lucius	-	-	1	-	-	-	-	-	-	-	-	-	1
51	Western mosquitofish	Gambusia affinis	26	-	-	-	784	-	20	-	-	-	-	-	830
52	Brook silverside	Labidesthes sicculus	16	1	-	-	11	2	29	-	-	-	-	-	59
53	White bass	Morone chrysops	133	151	78	35	131	109	105	6	18	-	-	-	766
54	Yellow bass	Morone mississippiensis	1	7	4	2	1	-	-	-	-	-	-	-	15
55	Green sunfish	Lepomis cyanellus	1	-	1	-	1	-	-	-	-	-	-	-	3
56	Warmouth	Lepomis gulosus	1	-	5	-	7	-	2	-	-	-	-	-	15
57	Orangespotted sunfish	Lepomis humilis	20	-	7	-	6	1	-	-	-	-	-	-	34
58	Bluegill	Lepomis macrochirus	262	14	386	68	141	23	17	1	2	-	-	-	914
59	Redear sunfish	Lepomis microlophus	1	-	1	-	-	-	-	-	-	-	-	-	2
60	Smallmouth bass	Micropterus dolomieu	1	-	-	-	-	-	-	-	-	-	-	-	1
61	Largemouth bass	Micropterus salmoides	67	5	8	-	14	-	3	-	-	-	-	-	97
62	White crappie	Pomoxis annularis	11	7	28	4	11	26	4	1	2	-	-	-	94
63	Black crappie	Pomoxis nigromaculatus	40	33	365	81	60	43	5	2	22	-	-	-	651
64	Western sand darter	Ammocrypta clara	-	-	-	-	-	-	4	-	-	-	-	-	4
65	Mud darter	Etheostoma asprigene	-	-	-	-	-	-	1	-	-	-	-	-	1
66	Logperch	Percina caprodes	2	-	-	-	2	-	4	-	-	-	-	-	8
67	Slenderhead darter	Percina phoxocephala	2	-	-	-	1	-	-	-	-	-	-	-	3
68	River darter	Percina shumardi	1	1	-	-	13	-	1	-	-	-	-	-	16
69	Sauger	Stizostedion canadense	39	18	3	6	8	-	6	-	-	-	-	-	80
70	Walleye	Stizostedion vitreum	-	4	1	1	-	-	-	-	-	-	-	-	6
71	Freshwater drum	Aplodinotus grunniens	312	94	20	25	185	289	476	11	86	-	-	6	1504
			=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
			11237	1192	1339	549	4002	2044	7067	729	1092	0	0	31	29282

Gears: D - Day electrofishing
N - Night electrofishing
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X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
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T - Trawling (4.8-m bottom trawl)

Table 4.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Silver lamprey							0.17 (0.17)			
Spotted gar			0.06 (0.06)							
Longnose gar	0.11 (0.05)				0.08 (0.08)	0.09 (0.06)		0.17 (0.09)		
Shortnose gar	1.34 (0.23)		1.22 (0.38)		0.43 (0.15)	1.34 (0.32)	0.50 (0.34)	1.39 (0.33)		
Bowfin	0.01 (0.00)		0.17 (0.09)		0.17 (0.11)					
Goldeye	1.44 (0.59)		0.17 (0.17)		5.92 (2.02)	1.72 (0.88)		0.83 (0.33)		
Mooneye	0.80 (0.36)					0.47 (0.28)		1.72 (1.09)		
American eel	0.03 (0.03)					0.04 (0.04)				
Skipjack herring	0.79 (0.46)		0.06 (0.06)		0.17 (0.11)	0.83 (0.61)		0.83 (0.72)		
Gizzard shad	71.50 (12.11)		200.33 (59.88)		106.59 (21.92)	70.38 (16.84)	24.50 (5.70)	55.11 (14.02)		
Threadfin shad			0.06 (0.06)							
Central stoneroller	0.02 (0.02)							0.06 (0.06)		
Red shiner	0.03 (0.03)					0.04 (0.04)				
Spotfin shiner	0.65 (0.24)		0.11 (0.11)		0.25 (0.13)	0.83 (0.34)		0.33 (0.23)		
Common carp	16.73 (2.39)		8.33 (1.33)		3.92 (1.31)	15.75 (2.77)	50.00 (8.05)	20.56 (5.33)		
Silver chub	0.09 (0.06)				0.33 (0.19)	0.09 (0.09)		0.11 (0.08)		
Golden shiner	0.01 (0.01)		0.17 (0.12)		0.25 (0.25)					
Emerald shiner	3.38 (0.77)		1.17 (0.43)		3.11 (1.84)	3.09 (0.86)	2.83 (1.49)	4.39 (1.78)		
River shiner	0.46 (0.16)		0.17 (0.12)			0.52 (0.21)		0.39 (0.28)		
Sand shiner	0.02 (0.02)				0.08 (0.08)			0.06 (0.06)		
Channel shiner	0.07 (0.05)				0.17 (0.11)			0.22 (0.17)		
Bluntnose minnow	0.02 (0.02)							0.06 (0.06)		
Bullhead minnow	0.19 (0.06)		0.67 (0.35)		1.75 (0.62)	0.13 (0.07)		0.22 (0.10)		
River carpsucker	0.73 (0.20)		2.78 (1.63)		1.00 (0.74)	0.39 (0.20)		1.22 (0.50)		
Quillback	0.05 (0.05)							0.17 (0.17)		
Blue sucker	0.02 (0.02)							0.06 (0.06)		
Smallmouth buffalo	3.36 (0.55)		5.89 (1.44)		9.06 (1.74)	3.62 (0.75)	6.33 (2.32)	2.22 (0.76)		
Bigmouth buffalo	0.34 (0.11)		1.39 (0.46)		1.01 (0.74)	0.17 (0.10)	0.33 (0.21)	0.56 (0.32)		
Black buffalo	0.34 (0.12)		0.56 (0.22)			0.31 (0.13)		0.39 (0.29)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shorthead redhorse	0.15 (0.06)		0.06 (0.06)			0.13 (0.07)	1.83 (0.95)	0.22 (0.15)		
Black bullhead					0.08 (0.08)					
Channel catfish	2.74 (0.54)		1.11 (0.47)		1.00 (0.25)	3.14 (0.75)	2.67 (1.09)	2.11 (0.70)		
Flathead catfish	1.05 (0.27)		0.28 (0.14)		0.17 (0.11)	1.11 (0.38)	5.33 (2.23)	1.06 (0.35)		
Western mosquitofish	0.11 (0.04)		1.22 (0.63)		0.08 (0.08)	0.04 (0.04)		0.11 (0.08)		
Brook silverside	0.21 (0.11)		0.28 (0.16)			0.09 (0.06)		0.50 (0.35)		
White bass	1.93 (0.35)		1.00 (0.23)		1.67 (0.47)	2.06 (0.50)	2.67 (1.09)	1.78 (0.39)		
Yellow bass			0.06 (0.06)							
Green sunfish							0.17 (0.17)			
Warmouth					0.08 (0.08)					
Orangespotted sunfish	0.04 (0.01)		0.89 (0.34)		0.33 (0.19)					
Bluegill	1.08 (0.28)		4.56 (1.03)		11.68 (3.50)	1.00 (0.41)	1.67 (1.12)	0.44 (0.25)		
Redear sunfish	0.03 (0.03)					0.04 (0.04)				
Smallmouth bass	0.02 (0.02)							0.06 (0.06)		
Largemouth bass	0.54 (0.17)		0.11 (0.08)		3.70 (0.99)	0.61 (0.24)	0.17 (0.17)	0.33 (0.23)		
White crappie	0.07 (0.04)		0.39 (0.18)		0.17 (0.11)	0.09 (0.06)				
Black crappie	0.29 (0.10)		1.11 (0.35)		0.58 (0.31)	0.22 (0.11)	0.33 (0.21)	0.33 (0.23)		
Logperch					0.17 (0.11)					
Slenderhead darter	0.06 (0.06)					0.09 (0.09)				
River darter					0.08 (0.08)					
Sauger	0.36 (0.12)		0.06 (0.06)		2.01 (0.46)	0.39 (0.17)		0.28 (0.14)		
Freshwater drum	5.12 (1.87)		3.78 (0.80)		2.58 (0.81)	5.42 (2.70)	2.60 (0.68)	4.67 (1.80)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
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 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Spotted gar	0.08 (0.03)		0.67 (0.23)							
Shortnose gar	2.65 (0.95)		15.33 (6.95)		3.22 (1.48)			0.86 (0.56)		
Bowfin	0.14 (0.08)		1.16 (0.64)		0.19 (0.19)					
Gizzard shad	2.04 (1.85)		1.60 (0.57)		0.17 (0.17)			2.17 (2.17)		
Common carp	0.79 (0.35)		3.20 (1.06)		3.59 (3.20)			0.37 (0.37)		
Goldfish x carp	0.02 (0.02)				0.57 (0.57)					
River carpsucker	0.39 (0.16)		2.63 (1.33)		2.65 (0.72)					
Smallmouth buffalo	0.27 (0.15)		1.11 (0.53)					0.17 (0.17)		
Bigmouth buffalo	0.07 (0.03)		0.50 (0.26)		0.57 (0.39)					
Black buffalo	0.04 (0.02)		0.34 (0.19)							
Shorthead redhorse	0.03 (0.02)		0.25 (0.18)							
Black bullhead	0.07 (0.04)		0.33 (0.25)		0.96 (0.96)					
Yellow bullhead	0.05 (0.03)		0.41 (0.28)							
Brown bullhead	0.02 (0.01)		0.17 (0.11)		0.17 (0.17)					
Channel catfish	0.23 (0.16)		0.50 (0.23)		0.53 (0.24)			0.18 (0.18)		
Flathead catfish	0.21 (0.16)		0.34 (0.19)		0.38 (0.24)			0.18 (0.18)		
Northern pike	0.01 (0.01)				0.19 (0.19)					
White bass	1.40 (0.41)		5.32 (1.92)		1.51 (0.81)			0.85 (0.40)		
Yellow bass	0.03 (0.02)		0.17 (0.17)		0.34 (0.34)					
Green sunfish	0.01 (0.01)				0.19 (0.19)					
Warmouth	0.04 (0.02)		0.17 (0.11)		0.57 (0.39)					
Orangespotted sunfish	0.06 (0.03)		0.34 (0.26)		0.57 (0.57)					
Bluegill	3.58 (0.70)		18.13 (4.27)		30.23 (14.15)			0.70 (0.36)		
Redear sunfish	0.01 (0.01)				0.19 (0.19)					
Largemouth bass	0.07 (0.03)		0.50 (0.26)		0.36 (0.23)					
White crappie	0.81 (0.29)		1.83 (0.49)		0.38 (0.24)			0.68 (0.33)		
Black crappie	3.61 (0.77)		18.99 (4.13)		23.16 (8.55)			0.84 (0.65)		
Sauger	0.02 (0.01)		0.09 (0.09)		0.36 (0.23)					
Walleye	0.01 (0.01)		0.08 (0.08)							

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Table 4.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Freshwater drum	1.02 (0.25)		1.01 (0.35)		0.38 (0.38)			1.04 (0.28)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	3.12 (1.03)	7.21 (2.52)		0.27 (0.18)						
Bowfin	0.07 (0.07)	0.17 (0.17)								
Goldeye	0.12 (0.07)	0.16 (0.10)		0.09 (0.09)						
Skipjack herring	0.05 (0.05)			0.09 (0.09)						
Gizzard shad	6.22 (2.19)	11.26 (4.26)		2.69 (2.28)						
Common carp	0.67 (0.25)	0.90 (0.44)		0.50 (0.31)						
River carpsucker	0.34 (0.12)	0.58 (0.24)		0.18 (0.11)						
Smallmouth buffalo	0.32 (0.17)	0.67 (0.40)		0.08 (0.08)						
Bigmouth buffalo	0.03 (0.03)	0.08 (0.08)								
Black buffalo	0.22 (0.09)	0.41 (0.20)		0.09 (0.09)						
Shorthead redhorse	0.05 (0.05)			0.09 (0.09)						
Black bullhead	0.06 (0.05)			0.09 (0.09)						
Yellow bullhead	0.03 (0.03)	0.08 (0.08)								
Channel catfish	0.34 (0.14)	0.40 (0.26)		0.30 (0.16)						
Flathead catfish	0.12 (0.06)	0.17 (0.11)		0.08 (0.08)						
White bass	1.31 (0.43)	2.09 (0.76)		0.77 (0.52)						
Yellow bass	0.07 (0.04)	0.16 (0.10)								
Bluegill	3.02 (1.66)	2.02 (0.78)		3.71 (2.79)						
White crappie	0.16 (0.10)	0.16 (0.10)		0.16 (0.16)						
Black crappie	3.47 (1.45)	1.86 (0.87)		4.60 (2.41)						
Sauger	0.28 (0.13)			0.48 (0.23)						
Walleye	0.03 (0.03)			0.04 (0.04)						
Freshwater drum	1.09 (0.48)	0.49 (0.18)		1.50 (0.82)						

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Table 4.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Spotted gar			0.07 (0.07)							
Longnose gar	0.01 (0.01)		0.17 (0.17)		0.17 (0.17)					
Shortnose gar	0.86 (0.27)		4.39 (2.61)		0.85 (0.67)	0.67 (0.33)	0.18 (0.18)	0.80 (0.37)		
Bowfin	0.01 (0.00)		0.15 (0.10)							
Goldeye	0.06 (0.04)							0.20 (0.14)		
Mooneye	0.02 (0.02)							0.07 (0.07)		
Skipjack herring	0.04 (0.04)							0.13 (0.13)		
Gizzard shad	18.23 (9.07)		105.63 (97.21)		40.86 (23.72)	10.08 (8.91)	1.16 (0.96)	24.33 (19.98)		
Red shiner	0.04 (0.02)		0.45 (0.37)				0.65 (0.65)	0.07 (0.07)		
Spotfin shiner	0.82 (0.37)		3.20 (2.17)			0.50 (0.50)	5.07 (3.21)	1.24 (0.47)		
Common carp	0.48 (0.23)		0.78 (0.60)		1.89 (1.68)	0.50 (0.34)		0.34 (0.21)		
Mississippi silvery minnow	0.02 (0.02)							0.07 (0.07)		
Bighead carp	0.04 (0.04)							0.14 (0.14)		
Speckled chub	0.04 (0.04)							0.13 (0.13)		
Silver chub			0.08 (0.08)							
Golden shiner	0.01 (0.01)		0.17 (0.17)							
Emerald shiner	4.87 (2.56)		1.04 (0.45)		3.37 (1.48)	6.42 (3.83)	14.31 (13.06)	1.84 (0.71)		
River shiner	0.60 (0.20)		0.25 (0.25)			0.83 (0.31)	1.19 (0.76)	0.13 (0.09)		
Spottail shiner	0.11 (0.11)					0.17 (0.17)	0.18 (0.18)			
Silverband shiner	0.40 (0.26)		1.97 (1.97)		1.50 (1.50)		0.36 (0.36)	1.07 (0.88)		
Sand shiner	0.28 (0.14)				0.33 (0.33)	0.34 (0.21)		0.20 (0.11)		
Channel shiner	0.71 (0.36)		0.42 (0.42)		0.17 (0.17)		1.16 (0.96)	2.41 (1.27)		
Suckermouth minnow			0.09 (0.09)							
Bluntnose minnow	0.02 (0.02)		0.07 (0.07)				0.16 (0.16)	0.06 (0.06)		
Bullhead minnow	0.55 (0.24)		0.55 (0.24)		4.71 (2.11)	0.52 (0.36)	1.22 (0.50)	0.50 (0.20)		
River carpsucker	0.11 (0.11)					0.17 (0.17)				
Smallmouth buffalo	4.82 (4.41)		3.51 (2.78)			6.84 (6.63)		0.46 (0.46)		
Bigmouth buffalo	0.01 (0.01)				0.57 (0.57)					
Shorthead redhorse			0.08 (0.08)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Black bullhead					0.34 (0.34)					
Yellow bullhead	0.01 (0.01)		0.17 (0.17)		0.19 (0.19)					
Channel catfish	3.67 (2.37)		0.07 (0.07)		0.56 (0.56)	5.32 (3.57)	0.18 (0.18)	0.43 (0.18)		
Tadpole madtom	0.02 (0.02)								0.07 (0.07)	
Flathead catfish	0.06 (0.04)							0.20 (0.15)		
Western mosquitofish	5.09 (2.72)		63.34 (56.24)			3.67 (2.38)	0.90 (0.90)	0.45 (0.26)		
Brook silverside	0.25 (0.14)		0.16 (0.16)		0.17 (0.17)	0.34 (0.22)	0.82 (0.82)	0.07 (0.07)		
White bass	2.11 (0.66)		0.34 (0.19)		15.43 (12.46)	2.21 (0.77)	0.89 (0.58)	1.72 (1.44)		
Yellow bass			0.07 (0.07)							
Green sunfish			0.09 (0.09)							
Warmouth	0.06 (0.04)		0.45 (0.36)					0.14 (0.14)		
Orangespotted sunfish	0.12 (0.11)		0.36 (0.28)			0.17 (0.17)	0.18 (0.18)			
Bluegill	1.61 (0.57)		2.07 (0.83)		7.16 (3.13)	1.00 (0.63)	4.62 (1.99)	2.80 (1.34)		
Largemouth bass	0.15 (0.12)		0.95 (0.95)		0.38 (0.38)	0.17 (0.17)				
White crappie	0.24 (0.22)		0.42 (0.15)		0.68 (0.43)	0.33 (0.33)				
Black crappie	0.45 (0.15)		2.13 (1.37)		2.65 (2.65)	0.17 (0.17)	1.41 (0.59)	0.81 (0.26)		
Logperch			0.09 (0.09)				0.18 (0.18)			
Slenderhead darter	0.02 (0.02)							0.07 (0.07)		
River darter	0.08 (0.06)		0.09 (0.09)		1.48 (1.48)		0.18 (0.18)	0.20 (0.20)		
Sauger	0.05 (0.03)		0.09 (0.09)		0.52 (0.23)		0.36 (0.36)	0.13 (0.09)		
Freshwater drum	4.41 (2.37)		0.18 (0.12)		3.94 (3.55)	2.53 (0.62)	0.89 (0.18)	9.39 (8.18)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	1.17 (1.03)	2.72 (2.53)		0.09 (0.09)						
Skipjack herring	0.07 (0.07)	0.16 (0.16)								
Gizzard shad	42.19 (14.83)	74.71 (28.24)		19.44 (15.96)						
Common carp	0.62 (0.34)	0.58 (0.58)		0.66 (0.42)						
Speckled chub	0.15 (0.11)	0.24 (0.24)		0.08 (0.08)						
Silver chub	0.31 (0.15)	0.75 (0.36)								
Golden shiner	0.03 (0.03)	0.08 (0.08)								
Emerald shiner	1.40 (1.39)	3.40 (3.40)								
Silverband shiner	0.46 (0.39)	1.12 (0.95)								
Bullhead minnow	0.32 (0.12)	0.25 (0.11)		0.37 (0.20)						
River carpsucker	0.07 (0.07)	0.16 (0.16)								
Smallmouth buffalo	0.54 (0.38)	1.32 (0.94)								
Bigmouth buffalo	0.12 (0.10)	0.29 (0.24)								
Black buffalo	0.11 (0.11)			0.19 (0.19)						
Black bullhead	0.03 (0.03)	0.08 (0.08)								
Channel catfish	0.93 (0.23)	0.90 (0.25)		0.96 (0.35)						
Brook silverside	0.07 (0.07)	0.17 (0.17)								
White bass	5.21 (3.91)	2.14 (1.51)		7.37 (6.60)						
Orangespotted sunfish	0.03 (0.03)	0.08 (0.08)								
Bluegill	0.70 (0.32)	0.57 (0.26)		0.80 (0.51)						
White crappie	0.93 (0.52)	1.40 (1.17)		0.60 (0.37)						
Black crappie	2.07 (1.44)	0.74 (0.65)		2.99 (2.43)						
Freshwater drum	14.41 (8.12)	2.79 (0.99)		22.54 (13.86)						

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Gizzard shad		0.08 (0.08)								
Common carp	1.66 (0.38)	4.23 (1.87)		1.62 (0.78)		1.74 (0.52)	1.19 (0.63)	1.34 (0.53)		
River carpsucker	0.01 (0.01)	0.25 (0.25)		0.09 (0.09)						
Smallmouth buffalo	0.41 (0.28)	0.08 (0.08)		0.25 (0.18)		0.58 (0.42)		0.03 (0.03)		
Black buffalo	0.01 (0.00)	0.17 (0.11)		0.17 (0.17)			0.17 (0.17)			
Brown bullhead	0.01 (0.01)			0.42 (0.42)						
Blue catfish	0.06 (0.06)					0.09 (0.09)				
Channel catfish	6.03 (2.24)	0.08 (0.08)		0.58 (0.42)		5.62 (1.99)		7.85 (6.29)		
Flathead catfish	0.11 (0.05)					0.14 (0.07)	0.08 (0.08)	0.06 (0.04)		
White bass	0.15 (0.12)					0.21 (0.19)		0.03 (0.03)		
Bluegill		0.08 (0.08)								
White crappie		0.08 (0.08)								
Black crappie	0.02 (0.02)	0.08 (0.08)				0.02 (0.02)				
Freshwater drum	0.13 (0.05)					0.17 (0.07)	0.17 (0.11)	0.06 (0.04)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar		0.09 (0.09)								
Goldeye	0.02 (0.01)	1.11 (0.64)		0.08 (0.08)						
Skipjack herring		0.09 (0.09)		0.09 (0.09)						
Gizzard shad	0.08 (0.04)	1.36 (0.73)		0.25 (0.17)		0.07 (0.05)	0.09 (0.09)			
Goldfish		0.09 (0.09)								
Common carp	5.22 (1.08)	6.42 (4.11)		2.83 (1.97)		5.57 (1.50)	3.70 (2.16)	4.56 (1.36)		
Bighead carp	0.03 (0.03)					0.04 (0.04)				
River carpsucker	0.03 (0.02)			0.25 (0.17)		0.02 (0.02)	0.26 (0.26)	0.03 (0.03)		
Smallmouth buffalo	4.50 (1.18)	0.76 (0.37)		0.93 (0.59)		5.20 (1.58)	0.69 (0.37)	3.42 (1.88)		
Bigmouth buffalo	0.02 (0.02)	0.26 (0.17)				0.02 (0.02)	0.08 (0.08)			
Black buffalo	0.07 (0.04)	0.17 (0.17)				0.07 (0.05)	0.86 (0.56)	0.07 (0.07)		
Blue catfish	0.13 (0.06)					0.18 (0.09)		0.03 (0.03)		
Channel catfish	0.32 (0.10)	0.09 (0.09)		0.09 (0.09)		0.29 (0.14)	0.43 (0.25)	0.41 (0.12)		
Flathead catfish	0.21 (0.07)					0.20 (0.08)	0.17 (0.11)	0.26 (0.14)		
White bass	0.28 (0.24)	0.34 (0.25)		0.25 (0.25)		0.40 (0.35)	0.09 (0.09)			
Bluegill		0.17 (0.17)								
White crappie		0.17 (0.11)								
Black crappie	0.08 (0.05)	0.42 (0.33)		0.25 (0.25)			0.61 (0.43)	0.23 (0.16)		
Freshwater drum	0.87 (0.18)					1.26 (0.27)	2.61 (1.94)	0.10 (0.07)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.06 (0.03)					0.08 (0.05)				
Goldeye	0.59 (0.44)					0.77 (0.62)		0.17 (0.09)		
Mooneye	0.66 (0.22)					0.56 (0.19)		0.89 (0.60)		
Skipjack herring	1.19 (0.53)					1.65 (0.76)		0.14 (0.08)		
Gizzard shad	46.38 (23.54)					53.85 (32.80)		28.97 (18.22)		
Red shiner	0.62 (0.47)					0.04 (0.03)		1.97 (1.57)		
Spotfin shiner	1.92 (0.91)					0.60 (0.29)		4.97 (2.98)		
Common carp	0.67 (0.26)					0.73 (0.35)		0.53 (0.31)		
Mississippi silvery minnow	0.03 (0.02)							0.08 (0.06)		
Speckled chub	0.03 (0.02)					0.02 (0.02)		0.06 (0.04)		
Silver chub	0.10 (0.04)					0.08 (0.04)		0.14 (0.09)		
Golden shiner	0.03 (0.02)					0.02 (0.02)		0.06 (0.04)		
Emerald shiner	8.47 (1.87)					6.54 (1.48)		12.97 (5.18)		
River shiner	7.20 (1.94)					7.31 (2.67)		6.94 (1.84)		
Spottail shiner	0.02 (0.02)							0.06 (0.06)		
Sand shiner	0.12 (0.05)					0.10 (0.05)		0.17 (0.12)		
Channel shiner	4.93 (1.63)					2.44 (1.59)		10.72 (4.01)		
Suckermouth minnow	0.07 (0.03)					0.02 (0.02)		0.19 (0.09)		
Bullhead minnow	0.28 (0.18)					0.04 (0.03)		0.83 (0.59)		
River carpsucker	1.55 (0.95)					1.96 (1.35)		0.61 (0.45)		
Quillback	0.01 (0.01)							0.03 (0.03)		
Smallmouth buffalo	0.22 (0.07)					0.25 (0.10)		0.14 (0.07)		
Golden redhorse	0.01 (0.01)					0.02 (0.02)				
Channel catfish	1.62 (0.40)					1.40 (0.44)		2.14 (0.87)		
Flathead catfish	0.02 (0.02)					0.02 (0.02)		0.03 (0.03)		
Western mosquitofish	0.24 (0.10)					0.23 (0.13)		0.25 (0.11)		
Brook silverside	0.39 (0.12)					0.48 (0.17)		0.17 (0.10)		
White bass	1.15 (0.27)					0.92 (0.23)		1.69 (0.71)		
Warmouth	0.02 (0.02)					0.02 (0.02)		0.03 (0.03)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 26 of the Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Bluegill	0.16 (0.07)					0.06 (0.05)		0.39 (0.21)		
Largemouth bass	0.04 (0.02)					0.04 (0.03)		0.03 (0.03)		
White crappie	0.05 (0.03)					0.06 (0.05)		0.03 (0.03)		
Black crappie	0.06 (0.03)					0.06 (0.04)		0.06 (0.04)		
Western sand darter	0.04 (0.02)					0.02 (0.02)		0.08 (0.05)		
Mud darter	0.01 (0.01)					0.02 (0.02)				
Logperch	0.05 (0.03)					0.06 (0.04)		0.03 (0.03)		
River darter	0.01 (0.01)							0.03 (0.03)		
Sauger	0.06 (0.04)					0.02 (0.02)		0.14 (0.14)		
Freshwater drum	4.60 (1.42)					2.10 (0.54)		10.42 (4.58)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 26 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar									0.40 (0.24)
Shortnose gar									10.00 (3.36)
Goldeye									1.40 (0.40)
Skipjack herring									0.20 (0.20)
Gizzard shad									60.40 (25.73)
Grass carp									0.20 (0.20)
Spotfin shiner									0.20 (0.20)
Common carp									38.00 (4.64)
Emerald shiner									3.40 (1.91)
River shiner									0.20 (0.20)
Channel shiner									0.20 (0.20)
River carpsucker									3.20 (2.52)
Smallmouth buffalo									22.20 (9.64)
Bigmouth buffalo									2.40 (0.93)
Black buffalo									0.80 (0.58)
Shorthead redhorse									1.00 (0.55)
Channel catfish									0.60 (0.40)
Flathead catfish									0.60 (0.24)
Brook silverside									0.20 (0.20)
White bass									27.40 (4.86)
Yellow bass									1.40 (0.93)
Bluegill									2.60 (2.60)
Largemouth bass									0.80 (0.58)
White crappie									1.40 (1.17)
Black crappie									6.60 (6.11)
River darter									0.20 (0.20)
Sauger									3.00 (2.53)
Walleye									0.60 (0.40)
Freshwater drum									17.60 (11.47)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 4.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in Pool 26 of the Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Lake sturgeon									0.08 (0.08)
Shovelnose sturgeon									0.83 (0.30)
Common carp									0.08 (0.08)
Blue catfish									0.25 (0.13)
Channel catfish									0.83 (0.34)
Freshwater drum									0.50 (0.34)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

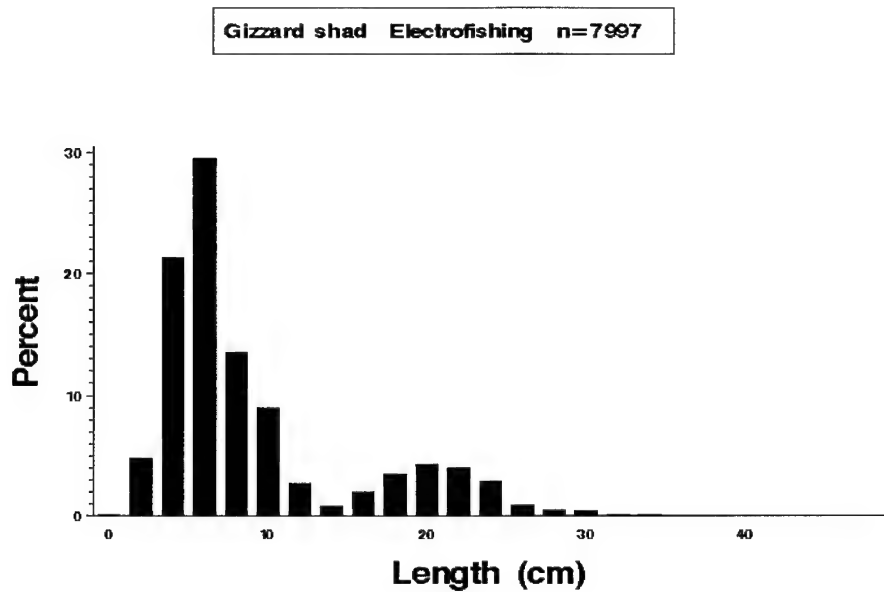


Figure 4.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

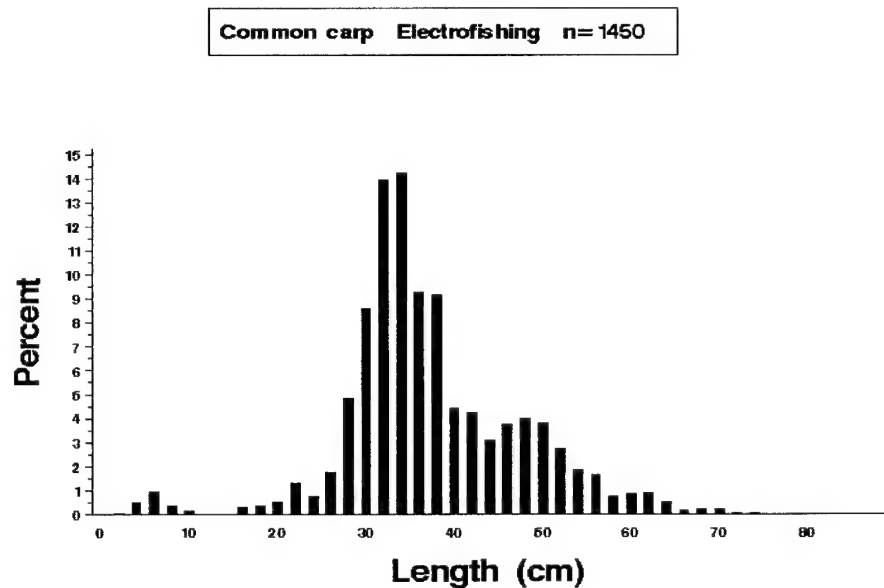


Figure 4.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

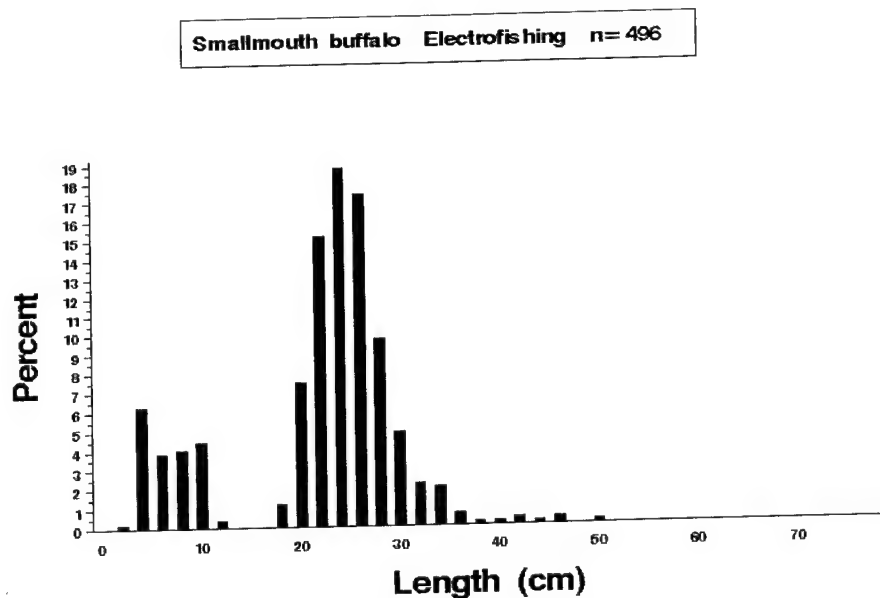


Figure 4.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

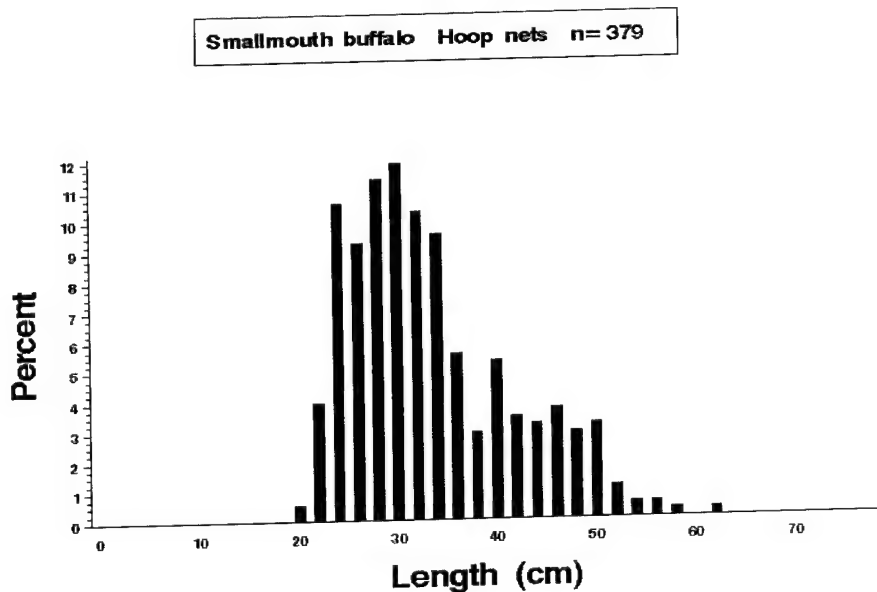


Figure 4.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by large and small hoop netting in Upper Mississippi River Pool 26 during 1995.

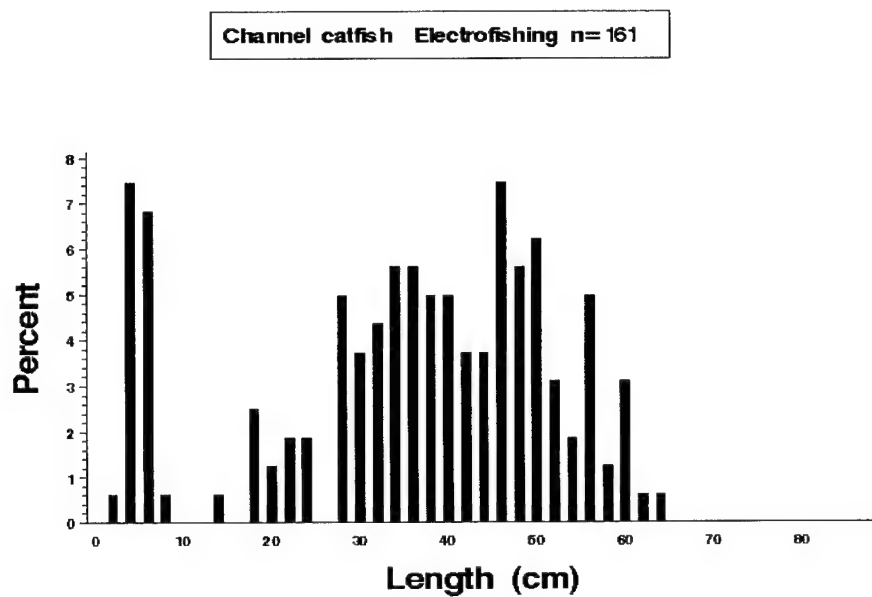


Figure 4.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

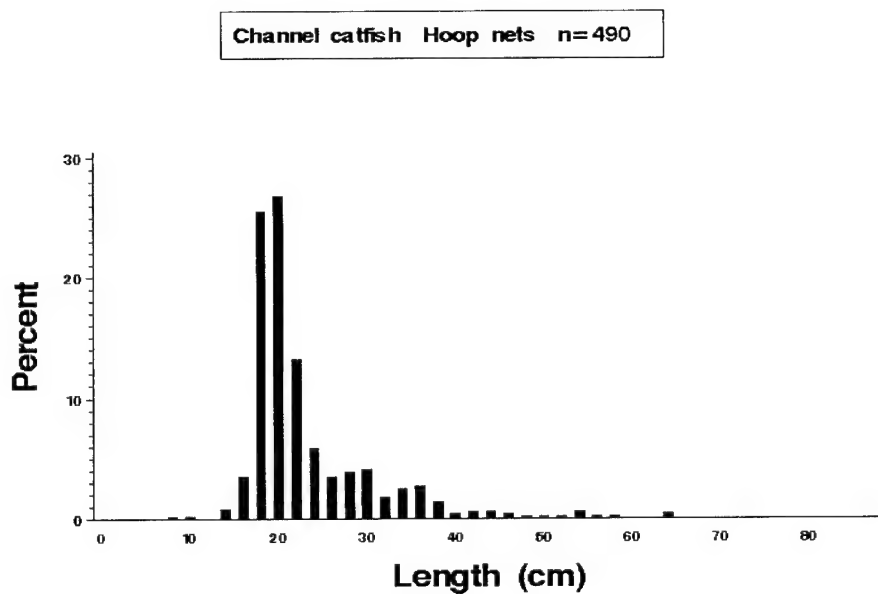


Figure 4.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by large and small hoop netting in Upper Mississippi River Pool 26 during 1995.

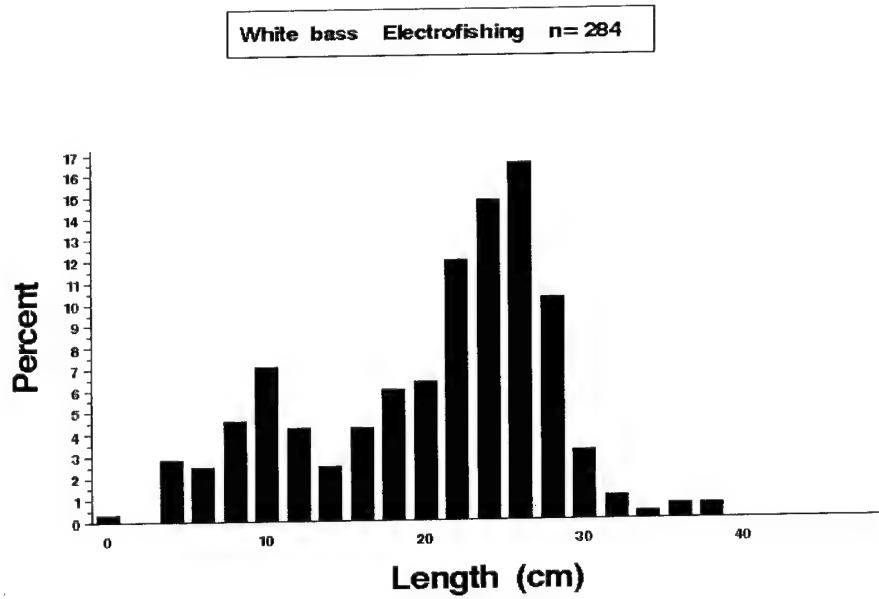


Figure 4.8. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

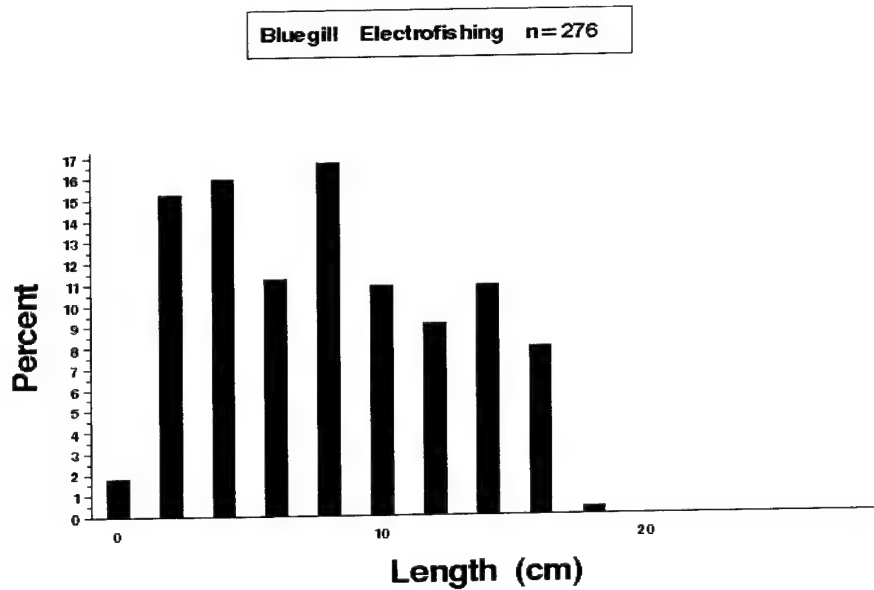


Figure 4.9. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

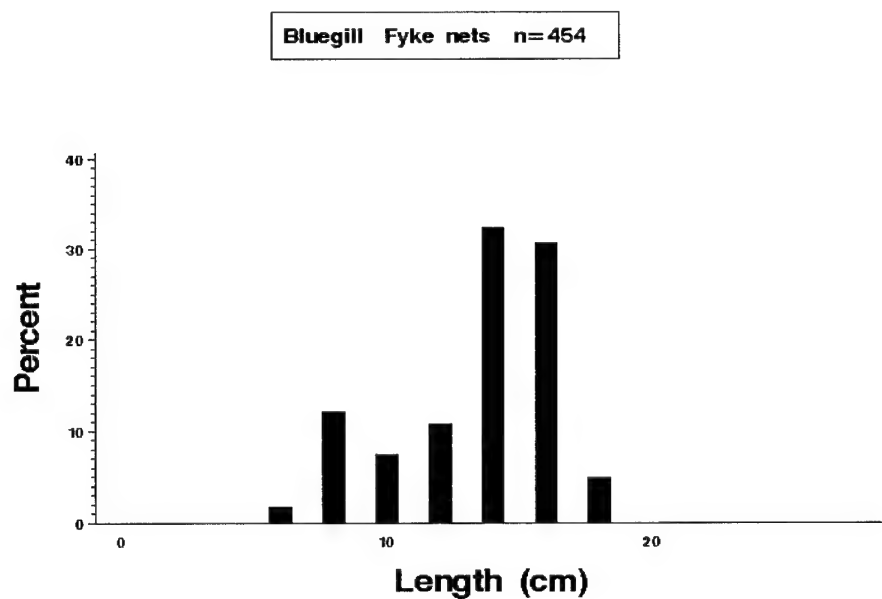


Figure 4.10. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 26 during 1995.

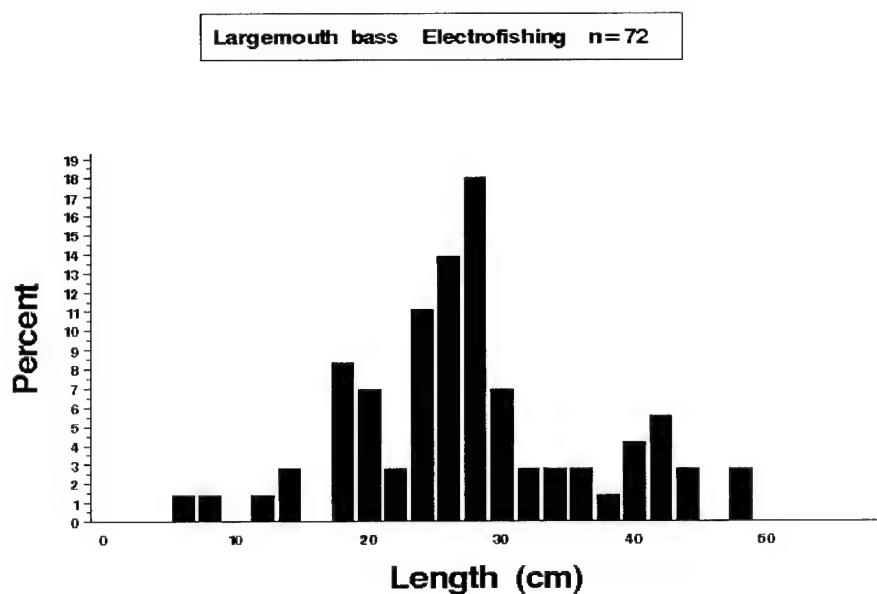


Figure 4.11. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

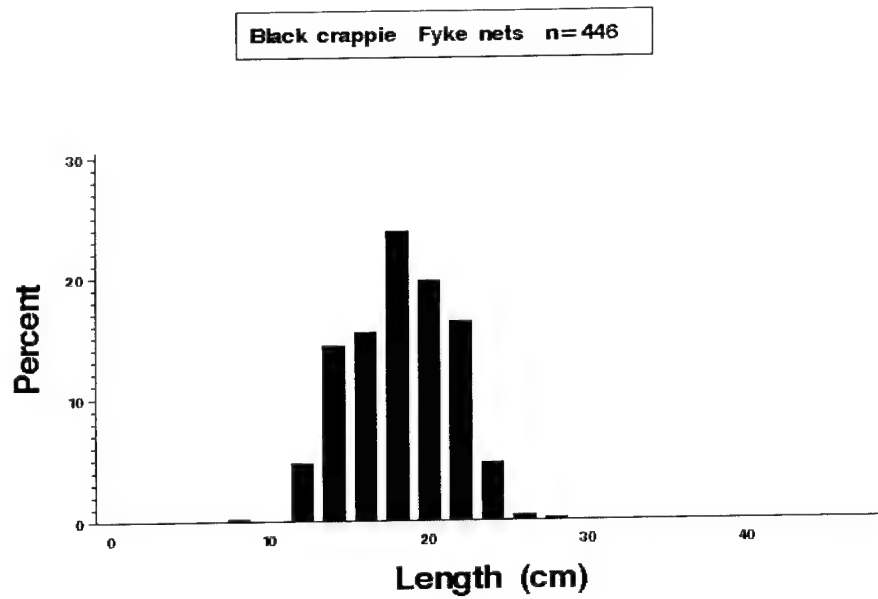


Figure 4.12. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Upper Mississippi River Pool 26 during 1995.

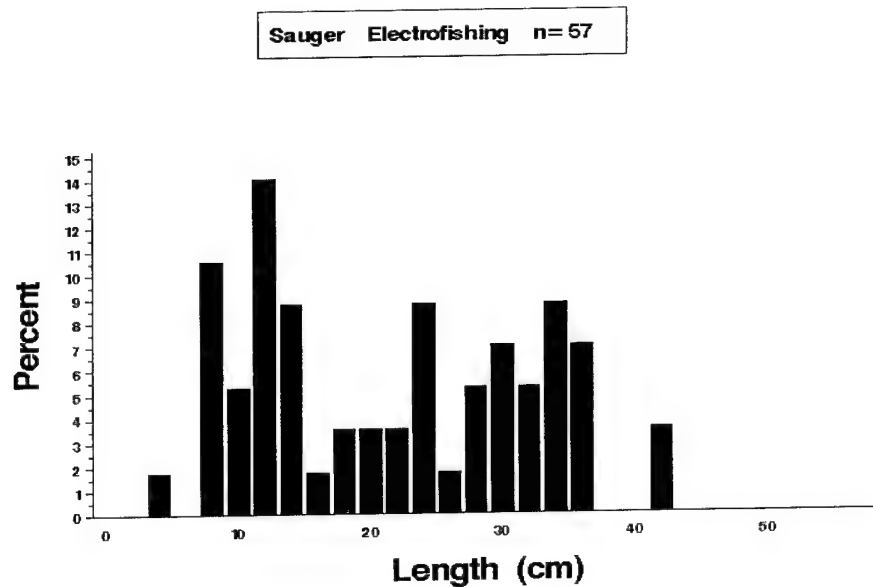


Figure 4.13. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

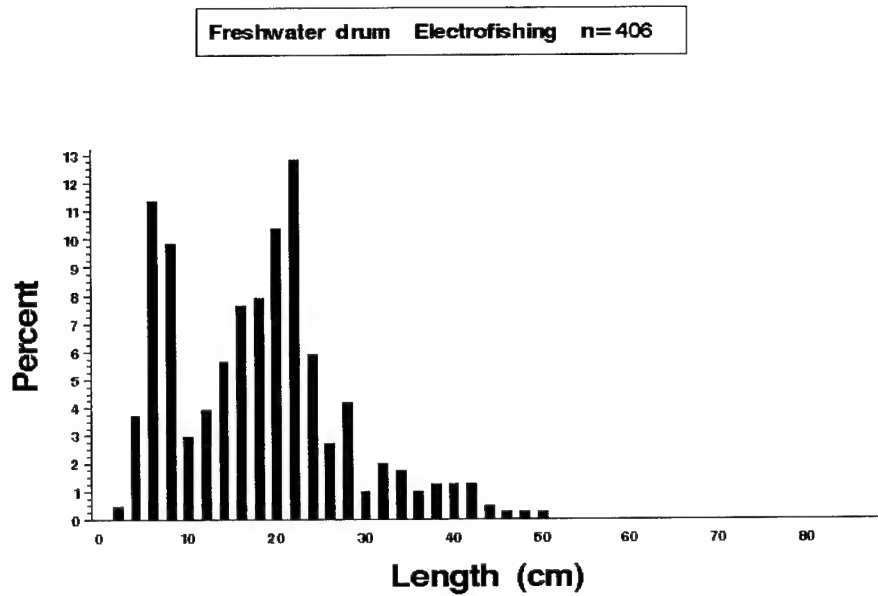


Figure 4.14. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 26 during 1995.

Chapter 5. Mississippi River Open Reach

by

Michael D. Petersen and David P. Herzog

Missouri Department of Conservation
3815 E. Jackson Boulevard
Jackson, Missouri 63755

Hydrograph

Open Mississippi River water stages are influenced by discharges from the Upper Mississippi, Missouri, Illinois, and to a lesser extent, Ohio Rivers. Water stage may frequently fluctuate in the open river by 3–5 feet/week and more than 20 feet/year. At stages above 22.0 feet (Cape Girardeau Gage, 326 feet above mean sea level), successful gear sets are reduced by high water velocity and flooded riparian vegetation. At stages between 22.0 and 17.0 feet, wing dams become totally to partly submerged. Water velocity above submerged wing dams limits the use of most sampling gear. At stages below 17.0 feet, closing structures emerge making it difficult to access side channels. Gear must be carried in or private landowner permission must be granted to access isolated waters. The SCB is the most difficult stratum to sample primarily because of access problems.

In 1995, water stages were higher than normal from late spring to fall, with stages close to the historical mean (321.8 feet above mean sea level) in March, April, and October. Fluctuations in water stage were typically 4–10 feet during 2-week periods. The lowest stage occurred on January 12 (9.1 feet) and the highest stage occurred on May 25 (46.6 feet). Water stages during LTRMP sampling in 1995 could be characterized as high and unstable (Figure 5.1). The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

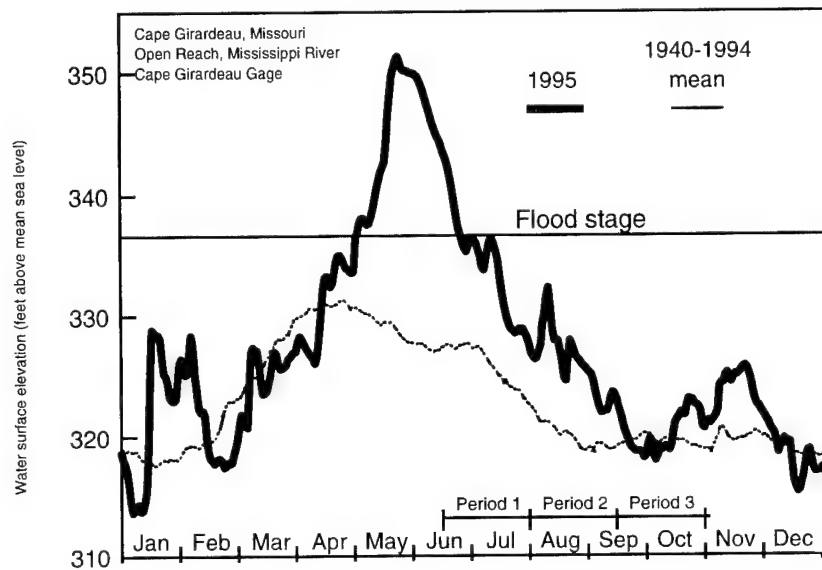


Figure 5.1. Daily water surface elevation from Cape Girardeau Gage for the Upper Mississippi River Open Reach, during 1995 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

Summary of Sampling Effort

In 1995, 405 random and fixed-site samples were planned, consisting of 135 samples in each of three periods. We planned 336 random samples in three habitat strata: MCBU (composing 27% of the total planned

random sampling effort), MCBW (25%), and SCB (48%). We also planned 69 samples in three fixed sites—two TRI (52%) and one MCBU stratum (48%).

We completed 290 samples (72% of what we planned to do) in 1995 consisting of 79, 108, and 103 samples in periods 1, 2, and 3, respectively (Table 5.1). We completed 233 random samples, 34 TRI fixed-site samples, and 23 MCBU fixed-site samples. The low effort for the MCBW stratum in period 1 was due to high water.

Total Catch by Gear

Historically, 129 fish species have been collected from the open river. Open River field station biologists have collected 95 species from 1991 through 1995. In 1995, we collected 72 species and 2 hybrids representing 23,679 fish (Table 5.2). The five most numerically abundant species were the gizzard shad (10,860), freshwater drum (7,066), common carp (903), goldeye (852), and bluegill (507).

The following summarizes total fish catch and number of species by gear: day electrofishing, 10,066 fish and 56 species; fyke netting, 461 fish and 19 species; mini fyke netting, 11,238 fish and 55 species; seining, 474 fish and 19 species; small hoop netting, 434 fish and 17 species; large hoop netting, 686 fish and 17 species; gill netting, 270 fish and 24 species; and trawling, 50 fish and 6 species.

In 1995, five new species were collected: blackspotted topminnow, dusky darter, greenside darter, stonecat, and spottail shiner. Two Missouri-listed species were collected, paddlefish and blue sucker, both of which are candidates for Federal listing.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

Gizzard shad (98.89), goldeye (32.66), and common carp (5.06) had the highest day electrofishing *C/f* when combining all habitat strata (Table 5.3.1). Curiously, these three species were most abundant in this order in MCBU, MCBW, and SCB strata.

Fyke Net

Freshwater drum (11.47), common carp (2.56), and white bass (1.17) had the highest fyke netting *C/f* when combining all habitat strata (Table 5.3.2). The highest *C/f* by habitat strata were MCBW: freshwater drum (15.84), black crappie and flathead catfish (3.47), and bluegill and common carp (2.97); and SCB: freshwater drum (11.11), common carp (2.52), and white bass (1.27).

Mini Fyke Net

Freshwater drum (322.81), gizzard shad (83.63), and bluegill (14.80) had the highest mini fyke netting *C/f* when combining all habitat strata (Table 5.3.3). The highest *C/f* by habitat strata were MCBU: freshwater drum (362.52), gizzard shad (88.06), and bluegill (16.27); MCBW: white crappie (13.03), gizzard shad (10.85), and black crappie (5.68); and SCB: gizzard shad (57.03), freshwater drum (56.74), and bluegill (4.91).

Small Hoop Net

Common carp (0.94), channel catfish (0.77), and freshwater drum (0.30) had the highest small hoop netting *C/f* when combining all habitat strata (Table 5.3.4). Common carp also had the highest *C/f* in MCBU (0.88) and MCBW (1.33) strata. Channel catfish (2.88), common carp (1.31), and flathead catfish (0.30) had the highest *C/f* in the SCB stratum.

Large Hoop Net

Smallmouth buffalo (1.36), common carp (1.08), and freshwater drum (0.92) had the highest large hoop netting *C/f* when combining all habitat strata (Table 5.3.5). The highest *C/f* by habitat strata were MCBU: smallmouth buffalo (1.39), freshwater drum (0.80), and common carp (0.73); MCBW: flathead catfish and common carp (0.48), channel catfish (0.14), and smallmouth buffalo (0.09); and SCB: common carp (3.66), freshwater drum (1.80), and river carpsucker (1.42).

Seine

Gizzard shad (15.34), emerald shiner (4.38), and Mississippi silvery minnow (2.63) had the highest seining *C/f* when combining all habitat strata (Table 5.3.6). The highest *C/f* by habitat strata were MCBU: gizzard shad (16.25), emerald shiner (4.88), and Mississippi silvery minnow (3.00); MCBW: gizzard shad (40.00), river shiner (3.00), and emerald shiner (2.50); and SCB: gizzard shad (6.63), emerald shiner and river shiner (0.88), and channel catfish (0.50). This is the first year we documented an increase in Mississippi silvery minnows in our catch.

Gill Net

Table 5.3.7 gives *C/f* by species and habitat strata for gill netting. *C/f*s were based only upon SCB samples and were highest for common carp (7.91), white bass (3.05), and gizzard shad (2.86).

Fixed Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

Gizzard shad (67.67), goldeye (7.00), and common carp (2.67) had the highest day electrofishing *C/f* in the MCBU stratum (Table 5.4.1). Gizzard shad (1,441.23), spotted bass (12.51), and bluegill (10.67) had the highest *C/f* in the TRI stratum.

Fyke Net

Freshwater drum (9.09), white bass (4.57), and shortnose gar (2.61) had the highest fyke netting *C/f* in the MCBU stratum (Table 5.4.2). Freshwater drum (7.35), common carp (3.88), and bluegill (3.49) had the highest *C/f* in the TRI stratum.

Mini Fyke Net

Freshwater drum (100.41), gizzard shad (19.87), and river shiner (12.56) had the highest mini fyke netting *C/f* in the MCBU stratum (Table 5.4.3). Freshwater drum (7.45), silverband shiner (4.76), and bluegill (4.63) had the highest *C/f* in the TRI stratum.

Small Hoop Net

Channel catfish (1.69) and American eel (0.52, note standard error) had the highest small hoop netting *C/f* in the MCBU stratum (Table 5.4.4). Common carp (3.19), channel catfish (1.34), and bluegill (0.61) had the highest *C/f* in the TRI stratum.

Large Hoop Net

Common carp (1.18), channel catfish (0.84), and freshwater drum (0.67) had the highest large hoop netting *C/f* in the MCBU stratum (Table 5.4.5). Common carp (2.30), black buffalo (0.59), and smallmouth buffalo (0.44) had the highest *C/f* in the TRI stratum.

Seine

Channel catfish (2.00), emerald shiner (1.75), and gizzard shad (1.50) had the highest seining *C/f* in the MCBU stratum (Table 5.4.6). Seine hauls were completed for other strata, but fish species were not caught with sufficient frequency for data analysis.

Trawl

Channel catfish (6.00), freshwater drum (3.00), and shovelnose sturgeon (1.00) had the highest trawling *C/f* in the MCBU stratum (Table 5.4.7).

Gill Net

Common carp (8.51), freshwater drum (4.48), and striped bass (2.86) had the highest gill netting *C/f* in the TRI stratum (Table 5.4.8). Gill nets were set in other strata, but fish species were not caught with sufficient frequency for data analysis.

Length Distributions of Selected Species

Length–frequency histograms are presented for selected species in Figures 5.2 to 5.15. Meaningful biological interpretation of the histograms is limited because of small sample size or size selectivity of the gear (Anderson and Neumann 1996). Despite these biases, some river managers may find the histograms useful, therefore we have included them in this report. No age–growth data are available at this time for the open Mississippi River study reach.

Gizzard Shad

We collected 7,781 gizzard shad by day electrofishing and measured 3,517 subsampled gizzard shad for length–frequency (Figure 5.2). The length–frequency distribution is bimodal at 20 and 280 mm. The 4,264 unmeasured gizzard shad were not applied to the length–frequency distribution. Most of the unmeasured gizzard shad were 60–80 mm long.

Common Carp

Three hundred forty-eight common carp were collected by day electrofishing (Figure 5.3). Most common carp were 280–460 mm long.

Smallmouth Buffalo

Eighty-four smallmouth buffalo were collected by day electrofishing (Figure 5.4). The length–frequency distribution was largely composed of 220–320-mm-long fish.

One hundred eleven smallmouth buffalo were collected by small and large hoop nets (Figure 5.5). The length–frequency shows a bimodal distribution at 260 and 460 mm.

Channel Catfish

Sixty-nine channel catfish were collected by day electrofishing (Figure 5.6). The length–frequency distribution shows a bimodal distribution at 40 and 420 mm.

Two hundred nine channel catfish were collected by small and large hoop nets (Figure 5.7). The length–frequency distribution comprised 60–660-mm-long fish. A large number of channel catfish were sampled between 140 and 220 mm long.

White Bass

One hundred twenty-eight white bass were collected by day electrofishing (Figure 5.8). The length–frequency distribution comprised 40–440-mm-long fish. The greatest number of white bass sampled were between 40 and 160 mm long.

Bluegill

Seventy-three bluegill were collected by day electrofishing (Figure 5.9). The length–frequency distribution comprised 10–180-mm-long fish, with the greatest number of those being 20–60 mm long.

Twenty-seven bluegill were collected by fyke netting (Figure 5.10). The length–frequency distribution comprised 100–160-mm-long fish, with the greatest number of those being 140 mm long. This was a small sample and may not be indicative of the true length–frequency distribution.

White Crappie

Fifteen white crappie were collected by fyke netting (Figure 5.11). The length–frequency distribution comprised 60–300-mm-long fish.

Black Crappie

Twenty-seven black crappie were collected by fyke netting (Figure 5.12). The length–frequency distribution comprised 60–280-mm-long fish.

Sauger

Seventeen sauger were collected by day electrofishing (Figure 5.13). The length–frequency distribution comprised 80–360-mm-long fish.

Freshwater Drum

Ninety-one freshwater drum were collected by day electrofishing (Figure 5.14). The length–frequency distribution comprised 40–440-mm-long fish, the greatest number of those being 200–320 mm long.

One hundred ninety-nine freshwater drum were collected by fyke netting (Figure 5.15). The length–frequency distribution comprised 100–440-mm-long fish, the greatest number of those being 240–32 mm long and having a mode of 280 mm.

Table 5.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in the open Mississippi River during 1995. Table entries are numbers of successfully completed standardized monitoring collections.

Table page: 1

Sampling period = 1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing			8	5				1		14
Fyke net			3	1	2			2		8
Gill net			2							2
Large hoop net			8	6				2		16
Small hoop net			8	6				2		16
Mini fyke net			11	6	4			2		23
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SUBTOTAL	0	0	40	24	6	0	0	9	0	79

Sampling period = 2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing			8	5	4			2		19
Fyke net			4	1				2		7
Gill net			2					2		4
Large hoop net			8	5	7			2		22
Small hoop net			8	5	8			2		23
Mini fyke net			8	5	4			2		19
Seine				8	2					10
Trawling			1	3						4
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SUBTOTAL	0	0	39	32	25	0	0	12	0	108

Sampling period = 3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing			8	5	4			3		20
Fyke net			4	1				2		7
Gill net			3					2		5
Large hoop net			8	5	4			2		19
Small hoop net			8	5	4			2		19
Mini fyke net			8	5	6			2		21
Seine			8	4						12
	----	----	----	----	----	----	----	----	----	----
SUBTOTAL	0	0	47	25	18	0	0	13	0	103
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
	0	0	126	81	49	0	0	34	0	290

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SBU - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in the open Mississippi River. See Table 5.1 for the list of sampling gears actually deployed in this study reach. Table page: 1

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	2	-	-	-	-	-	-	-	-	-	-	-	2
2	Shovelnose sturgeon	Scaphirhynchus platyrhynchus	-	-	-	-	-	-	-	-	-	2	-	5	7
3	Paddlefish	Polyodon spathula	-	-	-	-	-	-	-	-	-	3	-	-	3
4	Spotted gar	Lepisosteus oculatus	2	-	-	-	1	-	-	-	-	-	-	-	3
5	Longnose gar	Lepisosteus osseus	4	-	-	-	1	-	-	-	-	-	-	-	5
6	Shovelnose gar	Lepisosteus platostomus	84	-	29	-	36	-	2	1	2	17	-	-	171
7	Bowfin	Amia calva	12	-	7	-	2	-	-	1	-	2	-	-	24
8	Goldeye	Hiodon alosoides	784	-	1	-	47	-	19	-	-	1	-	-	852
9	Mooneye	Hiodon tergisus	6	-	-	-	-	-	-	-	-	1	-	-	7
10	American eel	Anguilla rostrata	1	-	-	-	-	-	-	5	-	-	-	-	6
11	Skipjack herring	Alosa chrysochloris	6	-	-	-	2	-	1	-	2	15	-	-	26
12	Gizzard shad	Dorosoma cepedianum	7781	-	19	-	2766	-	269	1	1	23	-	-	10860
13	Threadfin shad	Dorosoma petenense	4	-	-	-	2	-	-	-	-	-	-	-	6
14	Central stoneroller	Camptostoma anomalum	-	-	-	-	5	-	-	-	-	-	-	-	5
15	Goldfish	Carassius auratus	1	-	-	-	-	-	-	-	1	-	-	-	2
16	Grass carp	Ctenopharyngodon idella	-	-	-	-	-	-	-	-	4	2	-	-	6
17	Red shiner	Cyprinella lutrensis	101	-	-	-	61	-	1	-	-	-	-	-	163
18	Spotfin shiner	Cyprinella spiloptera	5	-	-	-	2	-	-	-	-	-	-	-	7
19	Common carp	Cyprinus carpio	348	-	51	-	38	-	-	151	235	79	-	1	903
20	Mississippi silvery minnow	Hybognathus nuchalis	5	-	-	-	3	-	26	-	-	-	-	-	34
21	Plains minnow	Hybognathus placitus	-	-	-	-	1	-	-	-	-	-	-	-	1
22	Bighead carp	Hypophthalmichthys nobilis	-	-	1	-	-	-	-	-	-	-	-	-	1
23	Speckled chub	Macrhybopsis aestivalis	-	-	-	-	1	-	-	-	-	-	-	-	1
24	Sicklefin chub	Macrhybopsis meeki	-	-	-	-	-	-	1	-	-	-	-	-	1
25	Silver chub	Macrhybopsis storeriana	4	-	-	-	35	-	6	-	-	-	-	-	45
26	Bigeye chub	Notropis amblops	-	-	-	-	-	-	1	-	-	-	-	-	1
27	Emerald shiner	Notropis atherinoides	74	-	-	-	58	-	58	-	-	-	-	-	190
28	River shiner	Notropis blennioides	9	-	-	-	64	-	25	-	-	-	-	-	98
29	Spottail shiner	Notropis hudsonius	-	-	-	-	1	-	-	-	-	-	-	-	1
30	Silverband shiner	Notropis shumardi	26	-	-	-	107	-	9	-	-	-	-	-	142
31	Mimic shiner	Notropis volucellus	-	-	-	-	12	-	-	-	-	-	-	-	12
32	Channel shiner	Notropis wickliffi	2	-	-	-	67	-	2	-	-	-	-	-	71
33	Unidentified shiner	Notropis sp.	-	-	-	-	435	-	2	-	-	-	-	-	437
34	Bluntnose minnow	Pimephales notatus	1	-	-	-	3	-	-	-	-	-	-	-	4
35	Bullhead minnow	Pimephales vigilax	4	-	-	-	1	-	-	-	-	-	-	-	5
36	Unidentified minnow	Cyprinid sp.	-	-	-	-	-	-	1	-	-	-	-	-	1
37	River carpsucker	Carpiodes carpio	42	-	17	-	2	-	2	8	74	15	-	-	160
38	Quillback	Carpiodes cyprinus	1	-	-	-	-	-	-	-	-	-	-	-	1
39	Blue sucker	Cycleptus elongatus	3	-	-	-	-	-	-	-	-	-	-	-	3

Gears: D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting

S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 5.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in the open Mississippi River. See Table 5.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Smallmouth buffalo	Ictiobus bubalus	84	-	6	-	4	-	3	10	101	12	-	-	220
41	Bigmouth buffalo	Ictiobus cyprinellus	46	-	1	-	7	-	-	-	4	6	-	-	64
42	Black buffalo	Ictiobus niger	10	-	1	-	-	-	-	2	54	7	-	-	74
43	Unidentified buffalo	Ictiobus sp.	2	-	-	-	94	-	-	-	-	-	-	-	96
44	Shorthead rehorse	Moxostoma macrolepidotum	-	-	-	-	-	-	-	-	-	1	-	-	1
45	Black bullhead	Ameiurus melas	-	-	-	-	2	-	-	-	-	-	-	-	2
46	Blue catfish	Ictalurus furcatus	3	-	-	-	2	-	-	16	5	1	-	11	38
47	Channel catfish	Ictalurus punctatus	69	-	6	-	148	-	25	179	30	11	-	26	494
48	Stonecat	Noturus flavus	-	-	-	-	1	-	-	-	-	-	-	-	1
49	Freckled madtom	Noturus nocturnus	3	-	-	-	7	-	-	-	-	-	-	-	10
50	Unidentified madtom	Noturus sp.	-	-	-	-	2	-	-	-	-	-	-	-	2
51	Flathead catfish	Pylodictis olivaris	58	-	24	-	12	-	-	27	56	5	-	1	183
52	Blackstripe topminnow	Fundulus notatus	1	-	-	-	-	-	-	-	-	-	-	-	1
53	Blackspotted topminnow	Fundulus olivaceus	6	-	-	-	4	-	-	-	-	-	-	-	10
54	Western mosquitofish	Gambusia affinis	3	-	-	-	18	-	-	-	-	-	-	-	21
55	Brook silverside	Labidesthes sicculus	4	-	-	-	-	-	1	-	-	-	-	-	5
56	White bass	Morone chrysops	128	-	26	-	268	-	15	3	5	25	-	-	470
57	Yellow bass	Morone mississippiensis	2	-	-	-	2	-	-	1	-	-	-	-	5
58	Striped bass	Morone saxatilis	1	-	-	-	-	-	-	-	-	13	-	-	14
59	Flier	Centrarchus macropterus	6	-	-	-	1	-	-	-	-	-	-	-	1
60	Green sunfish	Lepomis cyanellus	6	-	-	-	7	-	-	-	-	-	-	-	13
61	Warmouth	Lepomis gulosus	-	-	-	-	20	-	-	-	-	-	-	-	20
62	Orangespotted sunfish	Lepomis humilis	5	-	1	-	8	-	-	-	-	-	-	-	14
63	Bluegill	Lepomis macrochirus	73	-	27	-	399	-	-	8	-	-	-	-	507
64	Longear sunfish	Lepomis megalotis	3	-	-	-	3	-	-	-	-	-	-	-	6
65	Green sunfish x orangespotted	L. cyanellus x L. humilis	1	-	-	-	-	-	-	-	-	-	-	-	1
66	Green sunfish x bluegill	L. cyanellus x L. macrochirus	2	-	-	-	-	-	-	-	-	-	-	-	2
67	Unidentified leopomis	Lepomis sp.	-	-	-	-	3	-	-	-	-	-	-	-	3
68	Spotted bass	Micropterus punctulatus	87	-	-	-	5	-	-	-	-	-	-	-	92
69	Largemouth bass	Micropterus salmoides	10	-	-	-	-	-	-	-	-	1	-	-	11
70	White crappie	Pomoxis annularis	24	-	15	-	254	-	-	2	1	1	-	-	297
71	Black crappie	Pomoxis nigromaculatus	15	-	27	-	115	-	-	2	1	-	-	-	160
72	Greenside darter	Etheostoma blennioides	-	-	-	-	1	-	-	-	-	-	-	-	1
73	Johnny darter	Etheostoma nigrum	-	-	-	-	1	-	-	-	-	-	-	-	1
74	Logperch	Percina caprodes	-	-	-	-	6	-	-	-	-	-	-	-	6
75	Slenderhead darter	Percina phoxocephala	-	-	-	-	1	-	-	-	-	-	-	-	1
76	Dusky darter	Percina sciera	1	-	-	-	-	-	-	-	-	-	-	-	1
77	River darter	Percina shumardi	1	-	-	-	4	-	-	-	-	-	-	-	5
78	Sauger	Stizostedion canadense	17	-	2	-	10	-	-	-	-	2	-	-	31

Gears: D - Day electrofishing

N - Night electrofishing

F - Fyke netting

X - Tandem fyke netting

M - Mini fyke netting

Y - Tandem mini fyke netting

S - Seining

HS - Small hoop netting

HL - Large hoop netting

G - Gill netting

TA - Trammel netting, anchored sets

T - Trawling (4.8-m bottom trawl)

Table 5.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in the open Mississippi River. See Table 5.1 for the list of sampling gears actually deployed in this study reach. Table page: 3

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
79	Freshwater drum	Aplodinotus grunniens	91	-	199	-	6610	-	8	17	110	25	-	6	7066
80	Larval fish	Unidentified	-	-	-	-	16	-	-	-	-	-	-	-	16
			=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
			10068	0	460	0	11789	0	476	434	686	270	0	50	24233

Gears: D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 5.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Chestnut lamprey	0.01 (0.01)						0.13 (0.13)	0.04 (0.04)		
Spotted gar								0.04 (0.04)		
Longnose gar	0.01 (0.01)							0.13 (0.07)		
Shortnose gar	0.87 (0.29)					0.58 (0.26)	0.13 (0.13)	3.04 (1.56)		
Bowfin	0.02 (0.01)							0.21 (0.08)		
Goldeye	32.66 (11.28)					36.00 (12.94)	11.50 (3.21)	9.79 (2.55)		
Mooneye	0.23 (0.16)					0.25 (0.18)		0.13 (0.09)		
American eel							0.13 (0.13)			
Skipjack herring	0.37 (0.23)					0.42 (0.26)		0.04 (0.04)		
Gizzard shad	98.89 (39.90)					100.83 (45.43)	57.50 (16.42)	87.96 (42.39)		
Threadfin shad	0.09 (0.07)					0.08 (0.08)		0.13 (0.09)		
Red shiner	1.08 (0.49)					0.75 (0.43)	0.25 (0.16)	3.58 (2.69)		
Spotfin shiner	0.02 (0.01)						0.25 (0.25)	0.13 (0.13)		
Common carp	5.06 (1.30)					4.75 (1.48)	8.00 (2.03)	7.08 (1.29)		
Mississippi silvery minnow	0.02 (0.01)							0.21 (0.12)		
Silver chub	0.02 (0.01)							0.17 (0.10)		
Emerald shiner	1.17 (0.80)					1.08 (0.91)	1.25 (0.56)	1.83 (0.64)		
River shiner	0.11 (0.08)					0.08 (0.08)		0.33 (0.29)		
Silverband shiner	0.45 (0.30)					0.42 (0.34)		0.71 (0.67)		
Channel shiner	0.08 (0.07)					0.08 (0.08)		0.04 (0.04)		
Bluntnose minnow								0.04 (0.04)		
Bullhead minnow	0.02 (0.02)							0.17 (0.13)		
River carpsucker	0.52 (0.21)					0.42 (0.23)	0.63 (0.26)	1.25 (0.45)		
Quillback							0.13 (0.13)			
Blue sucker							0.38 (0.26)			
Smallmouth buffalo	1.40 (0.46)					1.42 (0.53)	0.88 (0.40)	1.29 (0.42)		
Bigmouth buffalo	0.23 (0.11)					0.08 (0.08)	0.13 (0.13)	1.29 (0.69)		
Black buffalo	0.24 (0.11)					0.25 (0.13)		0.21 (0.08)		
Blue catfish	0.15 (0.10)					0.17 (0.11)	0.13 (0.13)			

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Channel catfish	0.99 (0.32)					0.92 (0.36)	2.00 (1.00)	1.46 (0.45)		
Freckled madtom	0.01 (0.01)						0.13 (0.13)	0.08 (0.08)		
Flathead catfish	0.70 (0.25)					0.67 (0.28)	2.75 (1.26)	0.79 (0.25)		
Blackspotted topminnow								0.04 (0.04)		
Western mosquitofish								0.04 (0.04)		
Brook silverside	0.07 (0.07)					0.08 (0.08)				
White bass	2.33 (0.81)					2.33 (0.92)	3.63 (1.39)	2.17 (0.52)		
Striped bass								0.04 (0.04)		
Green sunfish	0.02 (0.02)						0.13 (0.13)	0.17 (0.13)		
Bluegill	0.04 (0.02)						0.13 (0.13)	0.29 (0.14)		
Longear sunfish	0.01 (0.01)						0.13 (0.13)	0.08 (0.08)		
Green sunfish x bluegill	0.01 (0.01)							0.08 (0.06)		
Spotted bass	0.06 (0.02)						0.13 (0.13)	0.50 (0.20)		
Largemouth bass	0.01 (0.01)						0.25 (0.16)	0.04 (0.04)		
White crappie	0.25 (0.11)					0.25 (0.13)	0.38 (0.26)	0.21 (0.10)		
Black crappie	0.03 (0.01)						0.25 (0.16)	0.25 (0.12)		
River darter							0.13 (0.13)			
Sauger	0.40 (0.17)					0.42 (0.19)	0.13 (0.13)	0.29 (0.14)		
Freshwater drum	1.54 (0.51)					1.50 (0.58)	2.00 (0.60)	1.79 (0.63)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.64 (0.40)						2.48 (2.48)	0.49 (0.38)		
Bowfin	0.35 (0.25)						1.98 (1.98)	0.22 (0.22)		
Gizzard shad	0.19 (0.19)						2.48 (2.48)			
Common carp	2.56 (1.81)						2.97 (1.98)	2.52 (1.96)		
River carpsucker	0.71 (0.61)							0.76 (0.66)		
Smallmouth buffalo	0.38 (0.23)						0.99 (0.99)	0.33 (0.23)		
Bigmouth buffalo	0.10 (0.10)							0.11 (0.11)		
Channel catfish	0.10 (0.10)							0.11 (0.11)		
Flathead catfish	0.66 (0.29)						3.47 (2.48)	0.43 (0.24)		
White bass	1.17 (0.74)							1.27 (0.80)		
Orangespotted sunfish	0.10 (0.10)							0.11 (0.11)		
Bluegill	0.22 (0.22)						2.97 (2.97)			
Black crappie	0.37 (0.28)						3.47 (3.47)	0.12 (0.12)		
Freshwater drum	11.47 (7.38)						15.84 (8.91)	11.11 (7.97)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	1.25 (0.74)					1.42 (0.85)	0.44 (0.18)	0.08 (0.06)		
Bowfin							0.07 (0.07)			
Goldeye	1.61 (0.81)					1.78 (0.93)	0.25 (0.25)	0.53 (0.24)		
Skipjack herring	0.07 (0.07)					0.08 (0.08)		0.04 (0.04)		
Gizzard shad	83.63 (45.91)					88.06 (52.49)	10.85 (4.93)	57.03 (33.83)		
Threadfin shad	0.01 (0.00)						0.07 (0.07)	0.04 (0.04)		
Red shiner	0.61 (0.34)					0.56 (0.39)	0.94 (0.49)	0.96 (0.39)		
Spotfin shiner							0.12 (0.12)			
Common carp	1.13 (0.46)					1.19 (0.53)	0.07 (0.07)	0.81 (0.35)		
Mississippi silvery minnow							0.14 (0.14)			
Plains minnow	0.07 (0.07)					0.08 (0.08)				
Speckled chub								0.04 (0.04)		
Silver chub	0.56 (0.23)					0.56 (0.25)	0.44 (0.29)	0.56 (0.38)		
Emerald shiner	0.71 (0.37)					0.72 (0.42)	1.89 (0.94)	0.56 (0.34)		
River shiner	0.33 (0.28)					0.31 (0.31)	1.14 (0.72)	0.36 (0.25)		
Spottail shiner								0.04 (0.04)		
Silverband shiner	1.36 (0.53)					1.37 (0.59)	0.76 (0.76)	1.37 (1.06)		
Mimic shiner	0.05 (0.05)							0.44 (0.44)		
Channel shiner	0.80 (0.36)					0.71 (0.38)	0.76 (0.28)	1.47 (1.17)		
Bluntnose minnow	0.08 (0.07)					0.08 (0.08)		0.07 (0.07)		
Bullhead minnow	0.07 (0.07)					0.08 (0.08)				
River carpsucker	0.01 (0.00)						0.07 (0.07)	0.04 (0.04)		
Smallmouth buffalo	0.08 (0.07)					0.08 (0.08)	0.07 (0.07)	0.04 (0.04)		
Bigmouth buffalo	0.08 (0.07)					0.08 (0.08)	0.27 (0.15)	0.08 (0.08)		
Black bullhead	0.07 (0.07)					0.08 (0.08)		0.04 (0.04)		
Blue catfish	0.01 (0.01)							0.08 (0.05)		
Channel catfish	3.75 (1.30)					3.94 (1.49)	1.96 (0.64)	2.51 (1.23)		
Stonecat	0.07 (0.07)					0.08 (0.08)				
Freckled madtom	0.17 (0.10)					0.17 (0.11)		0.19 (0.19)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Flathead catfish	0.24 (0.15)					0.24 (0.17)	0.15 (0.10)	0.24 (0.14)		
Blackspotted topminnow	0.01 (0.01)						0.15 (0.15)	0.07 (0.07)		
Western mosquitofish	0.17 (0.14)					0.16 (0.16)		0.26 (0.22)		
White bass	10.12 (7.13)					11.38 (8.19)	5.07 (2.03)	1.31 (0.57)		
Flier	0.07 (0.07)					0.08 (0.08)				
Green sunfish	0.01 (0.01)						0.45 (0.21)	0.04 (0.04)		
Warmouth	0.32 (0.28)					0.32 (0.32)	0.43 (0.20)	0.31 (0.21)		
Orangespotted sunfish	0.15 (0.10)					0.16 (0.11)		0.08 (0.08)		
Bluegill	14.80 (12.91)					16.27 (14.81)	4.13 (2.27)	4.91 (2.49)		
Longear sunfish	0.07 (0.07)					0.08 (0.08)	0.07 (0.07)	0.04 (0.04)		
Spotted bass	0.14 (0.14)					0.16 (0.16)	0.14 (0.09)			
White crappie	1.19 (0.49)					1.04 (0.55)	13.03 (7.25)	1.35 (0.61)		
Black crappie	0.32 (0.15)					0.24 (0.17)	5.68 (2.45)	0.49 (0.31)		
Greenside darter								0.03 (0.03)		
Logperch	0.28 (0.15)					0.31 (0.18)		0.04 (0.04)		
Slenderhead darter								0.04 (0.04)		
River darter	0.14 (0.09)					0.16 (0.11)		0.03 (0.03)		
Sauger	0.20 (0.14)					0.23 (0.16)	0.27 (0.15)			
Freshwater drum	322.81 (188.16)					362.52 (215.90)	4.23 (1.81)	56.74 (31.52)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
American eel	0.01 (0.00)							0.04 (0.03)		
Gizzard shad								0.02 (0.02)		
Common carp	0.94 (0.25)					0.88 (0.28)	1.33 (0.38)	1.31 (0.40)		
River carpsucker	0.08 (0.07)					0.08 (0.08)		0.11 (0.07)		
Smallmouth buffalo	0.08 (0.05)					0.08 (0.05)		0.13 (0.09)		
Black buffalo	0.07 (0.07)					0.08 (0.08)				
Blue catfish	0.01 (0.01)						0.44 (0.35)	0.06 (0.04)		
Channel catfish	0.77 (0.22)					0.49 (0.21)	0.35 (0.18)	2.88 (0.94)		
Flathead catfish	0.24 (0.15)					0.23 (0.17)	0.18 (0.10)	0.30 (0.08)		
White bass	0.04 (0.03)					0.04 (0.04)		0.02 (0.02)		
Bluegill								0.02 (0.02)		
Freshwater drum	0.30 (0.20)					0.32 (0.23)	0.09 (0.09)	0.15 (0.07)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar								0.04 (0.03)		
Skipjack herring								0.02 (0.02)		
Goldfish								0.02 (0.02)		
Common carp	1.08 (0.27)					0.73 (0.27)	0.48 (0.29)	3.66 (1.18)		
River carpsucker	0.17 (0.08)						0.05 (0.05)	1.42 (0.69)		
Smallmouth buffalo	1.36 (0.51)					1.39 (0.58)	0.09 (0.09)	1.25 (0.50)		
Bigmouth buffalo	0.01 (0.00)							0.06 (0.04)		
Black buffalo	0.52 (0.33)					0.50 (0.37)		0.73 (0.32)		
Blue catfish	0.11 (0.05)					0.12 (0.06)		0.05 (0.05)		
Channel catfish	0.27 (0.14)					0.27 (0.16)	0.14 (0.10)	0.28 (0.11)		
Flathead catfish	0.47 (0.17)					0.44 (0.20)	0.48 (0.20)	0.71 (0.30)		
White bass	0.08 (0.07)					0.08 (0.08)		0.06 (0.05)		
White crappie								0.02 (0.02)		
Freshwater drum	0.92 (0.40)					0.80 (0.45)		1.80 (0.79)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.11 (0.11)					0.13 (0.13)	0.50 (0.50)			
Goldeye	1.96 (1.21)					2.25 (1.39)				
Skipjack herring							0.50 (0.50)			
Gizzard shad	15.34 (7.33)					16.25 (8.40)	40.00 (3.00)	6.63 (3.04)		
Red shiner	0.11 (0.11)					0.13 (0.13)				
Mississippi silvery minnow	2.63 (1.46)					3.00 (1.68)	1.00 (0.00)			
Sicklefin chub							0.50 (0.50)			
Silver chub	0.02 (0.02)						0.50 (0.50)	0.13 (0.13)		
Emerald shiner	4.38 (3.39)					4.88 (3.89)	2.50 (1.50)	0.88 (0.30)		
River shiner	1.44 (0.55)					1.50 (0.63)	3.00 (3.00)	0.88 (0.40)		
Silverband shiner	0.87 (0.75)					1.00 (0.87)				
Channel shiner	0.11 (0.11)					0.13 (0.13)				
River carpsucker	0.11 (0.11)					0.13 (0.13)	0.50 (0.50)			
Smallmouth buffalo	0.04 (0.02)							0.38 (0.18)		
Channel catfish	1.06 (0.58)					1.13 (0.67)	2.00 (2.00)	0.50 (0.33)		
Brook silverside	0.11 (0.11)					0.13 (0.13)				
White bass	1.33 (0.57)					1.50 (0.65)	1.00 (0.00)	0.13 (0.13)		
Freshwater drum	0.45 (0.33)					0.50 (0.38)	1.50 (1.50)			

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by gill netting in the open Mississippi River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shovelnose sturgeon	0.25 (0.25)							0.25 (0.25)		
Paddlefish	0.44 (0.30)							0.44 (0.30)		
Shortnose gar	1.61 (0.77)							1.61 (0.77)		
Goldeye	0.13 (0.13)							0.13 (0.13)		
Mooneye	0.13 (0.13)							0.13 (0.13)		
Skipjack herring	0.80 (0.63)							0.80 (0.63)		
Gizzard shad	2.86 (1.46)							2.86 (1.47)		
Grass carp	0.32 (0.32)							0.32 (0.32)		
Common carp	7.91 (3.45)							7.91 (3.46)		
River carpsucker	2.20 (1.33)							2.20 (1.33)		
Smallmouth buffalo	0.90 (0.36)							0.90 (0.36)		
Bigmouth buffalo	0.53 (0.37)							0.53 (0.37)		
Black buffalo	1.12 (0.54)							1.12 (0.54)		
Blue catfish	0.14 (0.14)							0.14 (0.14)		
Channel catfish	1.05 (0.67)							1.05 (0.68)		
Flathead catfish	0.30 (0.19)							0.30 (0.19)		
White bass	3.05 (1.46)							3.05 (1.46)		
Largemouth bass	0.16 (0.16)							0.16 (0.16)		
White crappie	0.16 (0.16)							0.16 (0.16)		
Sauger	0.15 (0.15)							0.15 (0.15)		
Freshwater drum	1.99 (0.80)							1.99 (0.80)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Spotted gar								0.17 (0.17)	
Longnose gar					0.33 (0.33)				
Shortnose gar					0.67 (0.67)			0.17 (0.17)	
Bowfin								1.17 (0.65)	
Goldeye					7.00 (5.13)			1.01 (0.64)	
Gizzard shad					67.67 (33.77)			1441.23 (1165.51)	
Goldfish								0.51 (0.51)	
Red shiner					1.33 (0.67)				
Common carp					2.67 (0.88)			8.51 (2.95)	
Emerald shiner					1.33 (0.88)			0.50 (0.34)	
Silverband shiner					0.33 (0.33)			1.52 (1.52)	
River carpsucker								0.33 (0.21)	
Smallmouth buffalo					0.67 (0.33)			4.50 (1.75)	
Bigmouth buffalo								2.17 (1.08)	
Black buffalo								0.33 (0.21)	
Channel catfish					0.33 (0.33)			1.00 (0.68)	
Flathead catfish					1.33 (0.88)			0.83 (0.40)	
Blackstripe topminnow								0.17 (0.17)	
Blackspotted topminnow								0.83 (0.54)	
Western mosquitofish								0.67 (0.50)	
Brook silverside								1.18 (0.99)	
White bass					2.00 (0.58)			2.84 (0.92)	
Yellow bass								0.33 (0.21)	
Green sunfish								0.17 (0.17)	
Orangespotted sunfish								0.83 (0.48)	
Bluegill					0.33 (0.33)			10.67 (5.08)	
Green sunfish x orangespotted sunfish								0.17 (0.17)	
Spotted bass					0.33 (0.33)			12.51 (3.04)	
Largemouth bass								1.17 (0.40)	
White crappie								3.52 (2.03)	

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Black crappie								1.17 (0.98)	
Dusky darter								0.17 (0.17)	
Sauger					1.00 (0.58)			0.17 (0.17)	
Freshwater drum								3.35 (1.39)	

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar					2.61 (2.14)			2.18 (1.10)	
Bowfin					0.32 (0.32)				
Goldeye					0.34 (0.34)				
Gizzard shad								2.60 (0.67)	
Common carp					0.97 (0.97)			3.88 (2.18)	
Bighead carp								0.17 (0.17)	
River carpsucker					0.65 (0.65)			1.46 (1.04)	
Smallmouth buffalo								0.17 (0.17)	
Black buffalo								0.17 (0.17)	
Channel catfish					0.33 (0.33)			0.78 (0.61)	
Flathead catfish					1.32 (0.32)			1.56 (1.37)	
White bass					4.57 (3.07)			0.21 (0.21)	
Bluegill					0.99 (0.56)			3.49 (2.40)	
White crappie					0.32 (0.32)			2.63 (1.43)	
Black crappie					0.33 (0.33)			3.35 (1.60)	
Sauger					0.65 (0.33)				
Freshwater drum					9.09 (5.64)			7.35 (2.55)	

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Spotted gar								0.20 (0.20)	
Longnose gar					0.39 (0.39)				
Shortnose gar					1.68 (1.68)			0.86 (0.86)	
Bowfin								0.19 (0.19)	
Goldeye					1.75 (0.64)				
Gizzard shad					19.87 (19.87)			1.80 (1.15)	
Central stoneroller					1.68 (1.68)				
Red shiner					5.96 (5.96)				
Common carp					0.34 (0.34)				
Mississippi silvery minnow					0.34 (0.34)				
Silver chub					0.35 (0.35)			1.25 (0.82)	
Emerald shiner					3.86 (3.86)				
River shiner					12.56 (10.14)				
Silverband shiner					5.96 (5.96)			4.76 (4.76)	
Channel shiner					2.83 (1.74)				
Smallmouth buffalo								0.16 (0.16)	
Channel catfish					2.61 (1.10)			0.23 (0.23)	
Flathead catfish								0.17 (0.17)	
Western mosquitofish					3.03 (3.03)				
White bass					4.26 (2.34)				
Yellow bass								0.37 (0.37)	
Warmouth								0.40 (0.40)	
Orangespotted sunfish								0.68 (0.33)	
Bluegill								3.27 (2.76)	
Spotted bass					0.34 (0.34)				
White crappie					0.78 (0.78)			4.63 (1.34)	
Black crappie								4.45 (2.68)	
Johnny darter								0.17 (0.17)	
Logperch								0.17 (0.17)	
River darter					0.34 (0.34)				

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Sauger					0.67 (0.67)			0.19 (0.19)	
Freshwater drum					100.41 (99.29)			7.45 (4.23)	

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar								0.10 (0.10)	
Bowfin								0.09 (0.09)	
American eel				0.52 (0.52)					
Common carp				0.34 (0.34)				3.19 (1.41)	
River carpsucker								0.10 (0.10)	
Smallmouth buffalo								0.18 (0.11)	
Blue catfish								0.28 (0.28)	
Channel catfish				1.69 (1.21)				1.34 (0.57)	
Flathead catfish								0.25 (0.17)	
White bass								0.08 (0.08)	
Yellow bass								0.10 (0.10)	
Bluegill								0.61 (0.42)	
White crappie								0.18 (0.11)	
Black crappie								0.19 (0.19)	

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Skipjack herring								0.08 (0.08)	
Gizzard shad								0.09 (0.09)	
Grass carp								0.39 (0.39)	
Common carp					1.18 (0.94)			2.30 (1.11)	
River carpsucker								0.33 (0.33)	
Smallmouth buffalo					0.17 (0.17)			0.44 (0.24)	
Bigmouth buffalo								0.08 (0.08)	
Black buffalo								0.59 (0.48)	
Channel catfish					0.84 (0.45)			0.17 (0.11)	
Flathead catfish								0.17 (0.11)	
Black crappie								0.08 (0.08)	
Freshwater drum					0.67 (0.45)			0.42 (0.33)	

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Goldeye					0.25 (0.25)				
Gizzard shad					1.50 (0.87)				
Silver chub					1.00 (0.71)				
Bigeye chub					0.25 (0.25)				
Emerald shiner					1.75 (0.75)				
Silverband shiner					0.25 (0.25)				
Channel shiner					0.25 (0.25)				
Channel catfish					2.00 (1.68)				
Freshwater drum					0.25 (0.25)				

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shovelnose sturgeon					1.00 (0.00)				
Blue catfish					0.50 (0.50)				
Channel catfish					6.00 (3.00)				
Freshwater drum					3.00 (1.00)				

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 5.4.8. Mean catch-per-unit-effort and (standard error) for fishes collected by gill netting in the open Mississippi River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar								2.55 (1.76)	
Bowfin								0.43 (0.43)	
Skipjack herring								2.17 (2.17)	
Gizzard shad								1.62 (1.31)	
Common carp								8.51 (3.30)	
River carpsucker								0.51 (0.51)	
Smallmouth buffalo								1.60 (0.87)	
Bigmouth buffalo								0.69 (0.42)	
Shorthead redhorse								0.25 (0.25)	
Channel catfish								1.44 (0.83)	
Flathead catfish								0.72 (0.48)	
White bass								1.34 (1.03)	
Striped bass								2.86 (2.54)	
Sauger								0.37 (0.37)	
Freshwater drum								4.48 (4.00)	

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

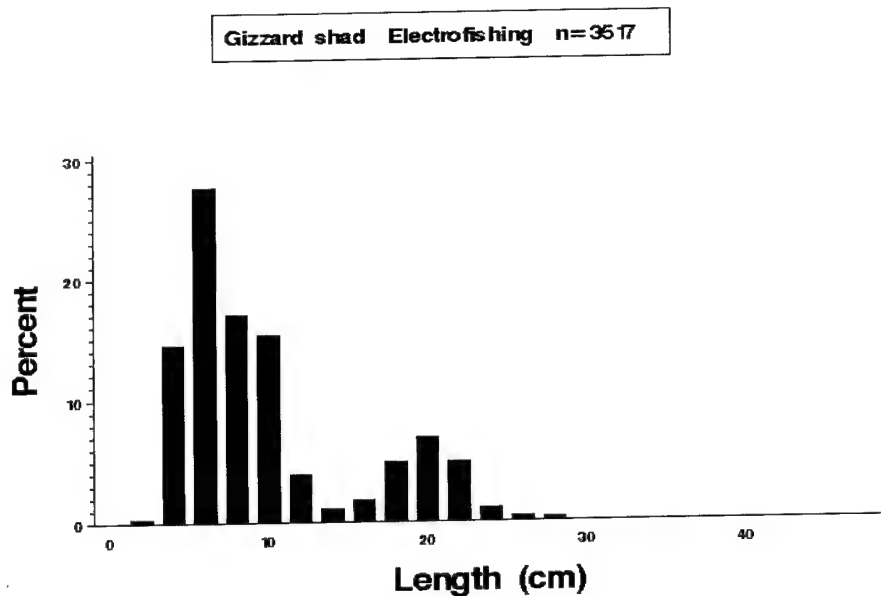


Figure 5.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in the Upper Mississippi River Open Reach during 1995.

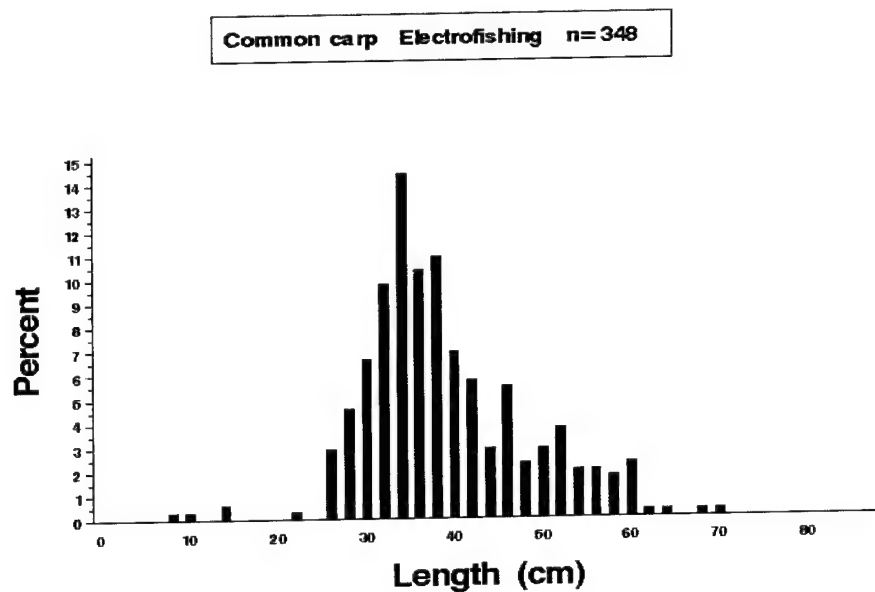


Figure 5.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in the Upper Mississippi River Open Reach during 1995.

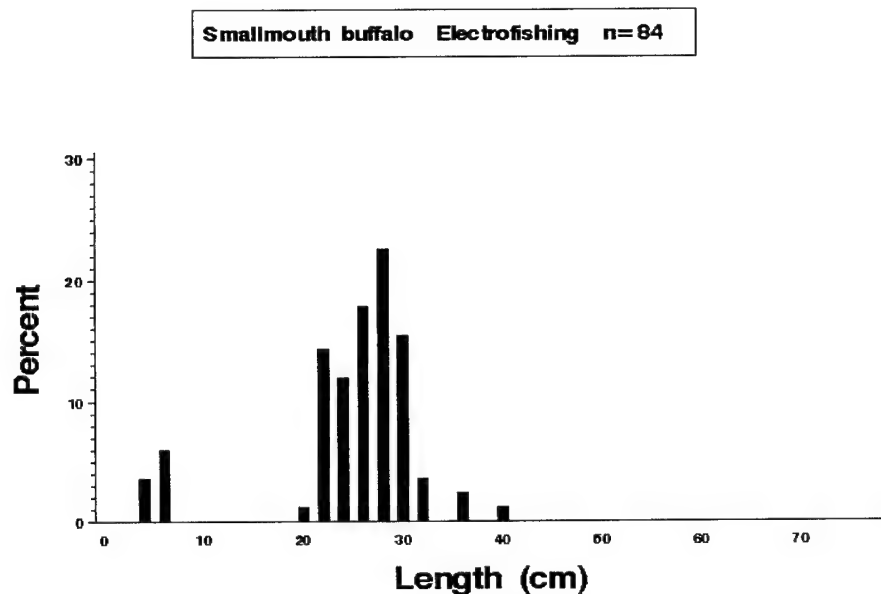


Figure 5.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1995.

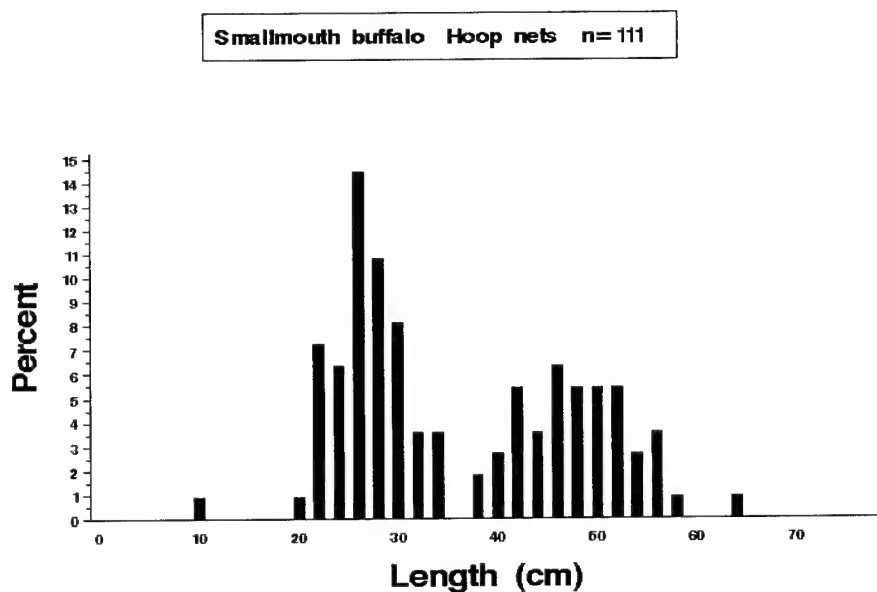


Figure 5.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by large and small hoop netting in the Upper Mississippi River Open Reach during 1995.

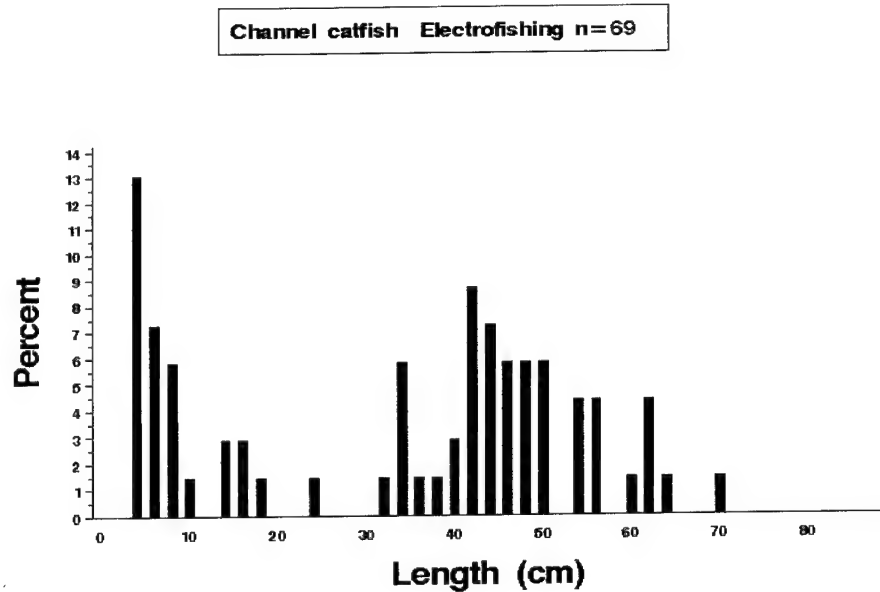


Figure 5.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1995.

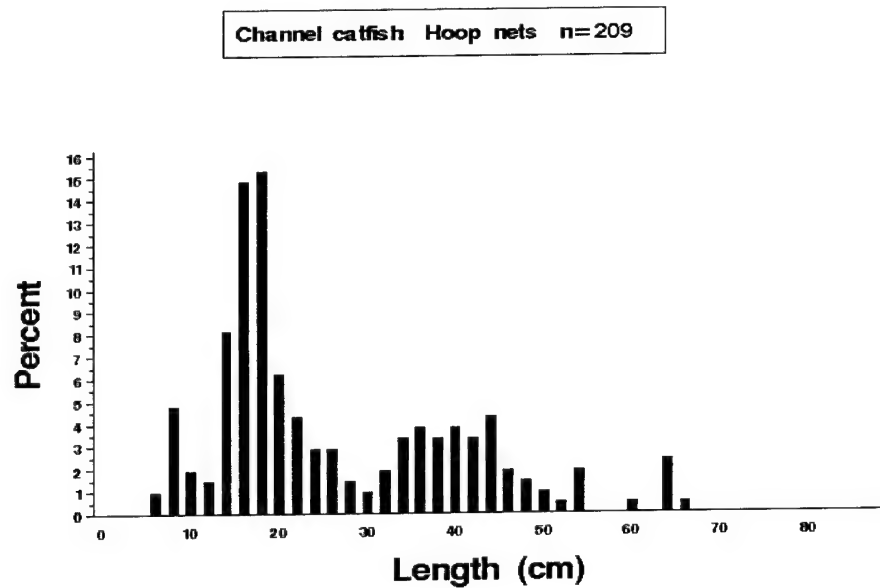


Figure 5.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by large and small hoop netting in the Upper Mississippi River Open Reach during 1995.

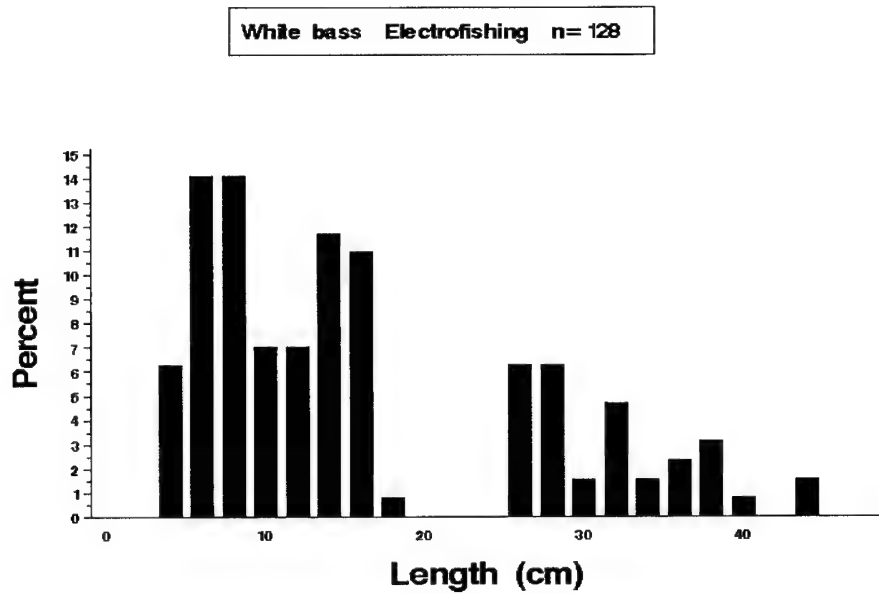


Figure 5.8. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in the Upper Mississippi River Open Reach during 1995.

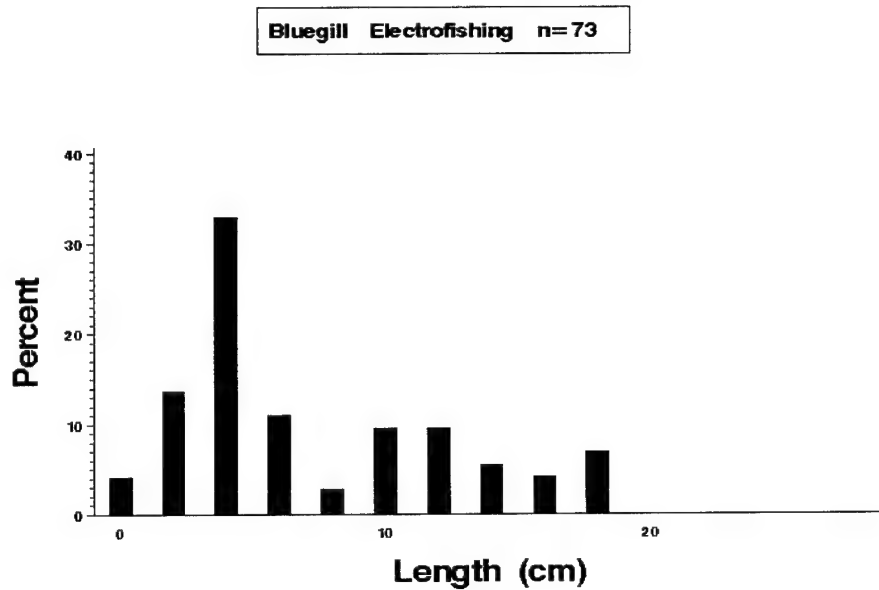


Figure 5.9. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1995.

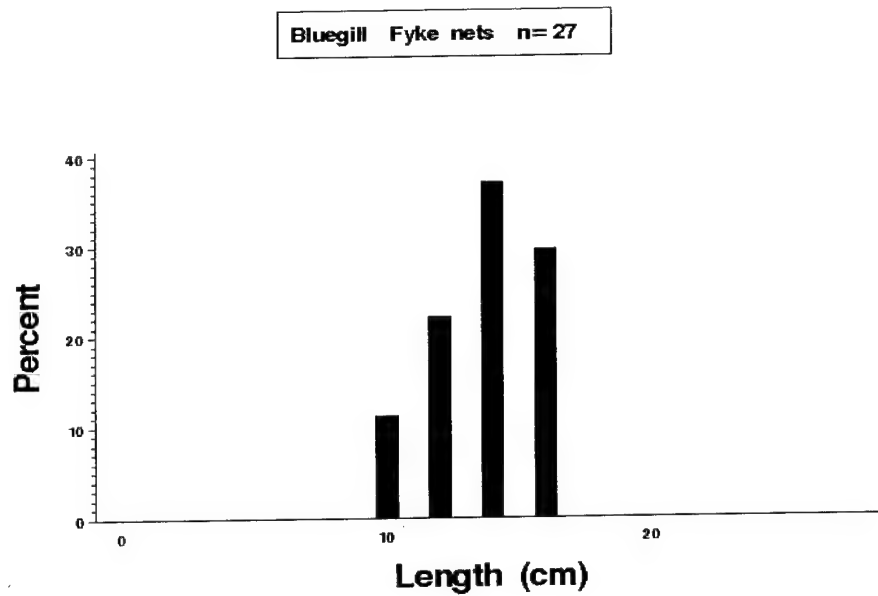


Figure 5.10. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in the Upper Mississippi River Open Reach during 1995.

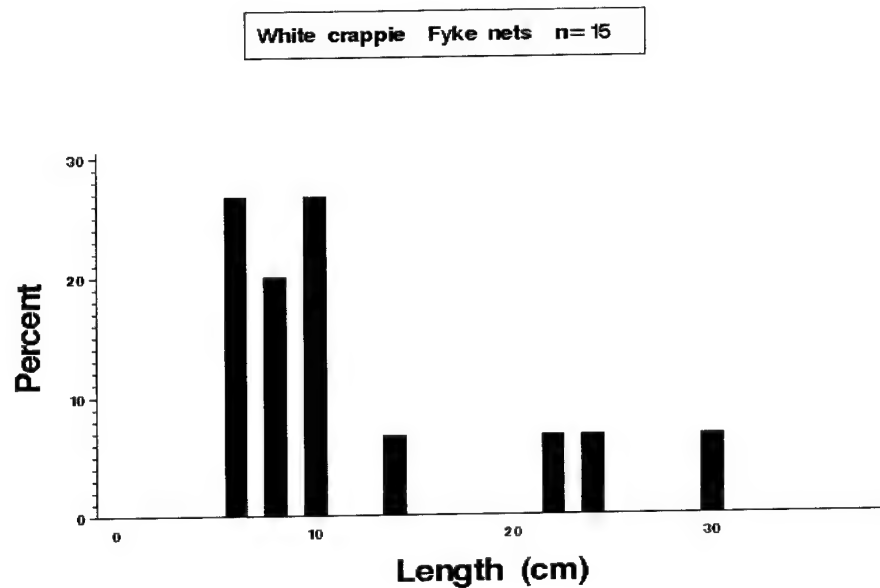


Figure 5.11. Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularis*) collected by fyke netting in the Upper Mississippi River Open Reach during 1995.

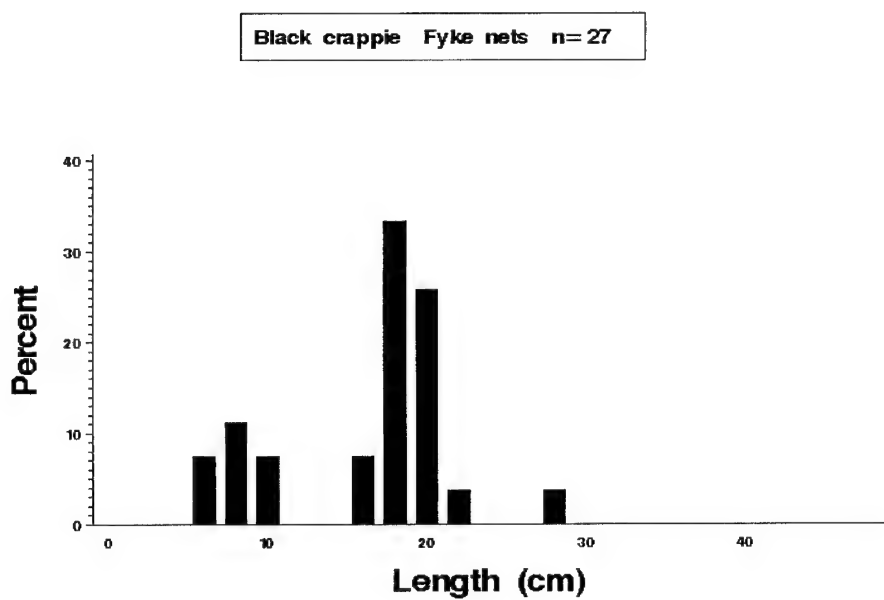


Figure 5.12. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in the Upper Mississippi River Open Reach during 1995.

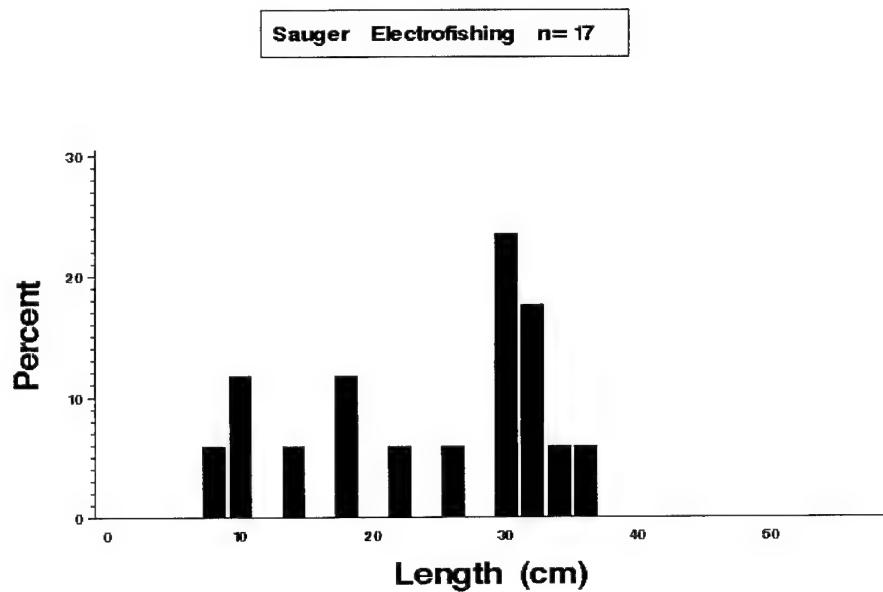


Figure 5.13. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in the Upper Mississippi River Open Reach during 1995.

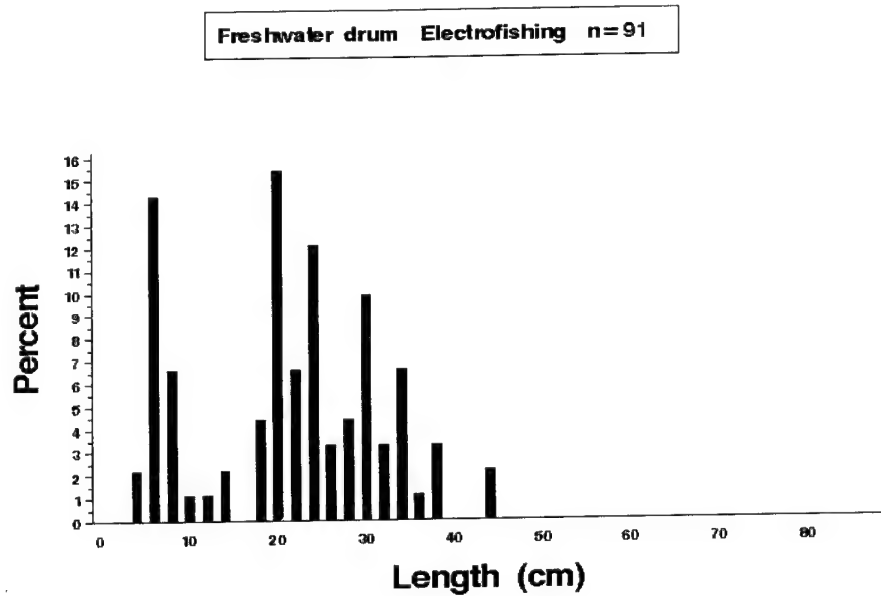


Figure 5.14. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in the Upper Mississippi River Open Reach during 1995.

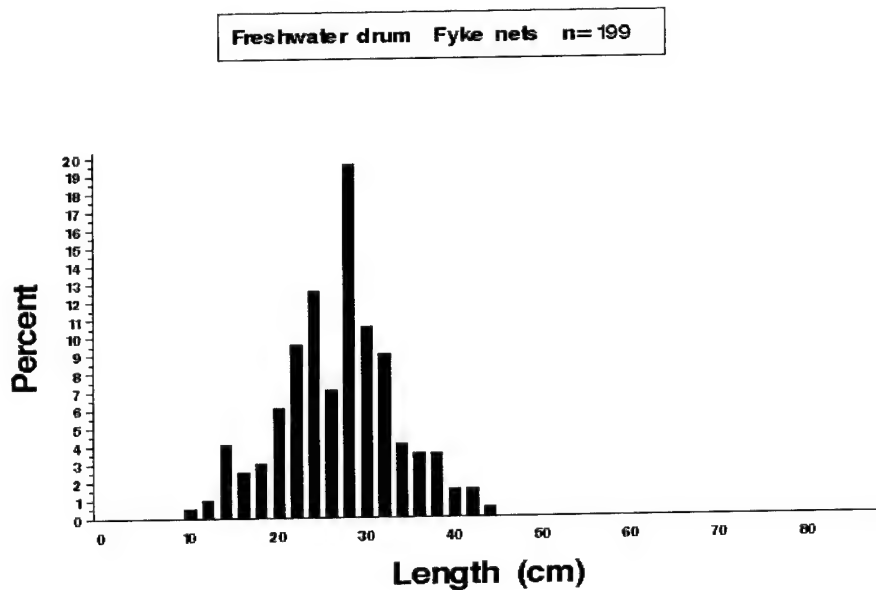


Figure 5.15. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in the Upper Mississippi River Open Reach during 1995.

Chapter 6. La Grange Pool, Illinois River

by

Kevin S. Irons, Timothy M. O'Hara, K. Douglas Blodgett, and Paul T. Raibley

Illinois Natural History Survey
Havana Field Station
704 N. Schrader Avenue
Havana, Illinois 62644

Hydrograph

In La Grange Pool of the Illinois River, water levels were above flood stage from the middle of April through the end of June in 1995 (Figure 6.1). The flood peak (450.7 feet above mean sea level) was the third highest ever recorded, just 0.8 feet below the all-time high. After declining in late June and early July, river levels remained below flood stage throughout the remaining two sampling periods. The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

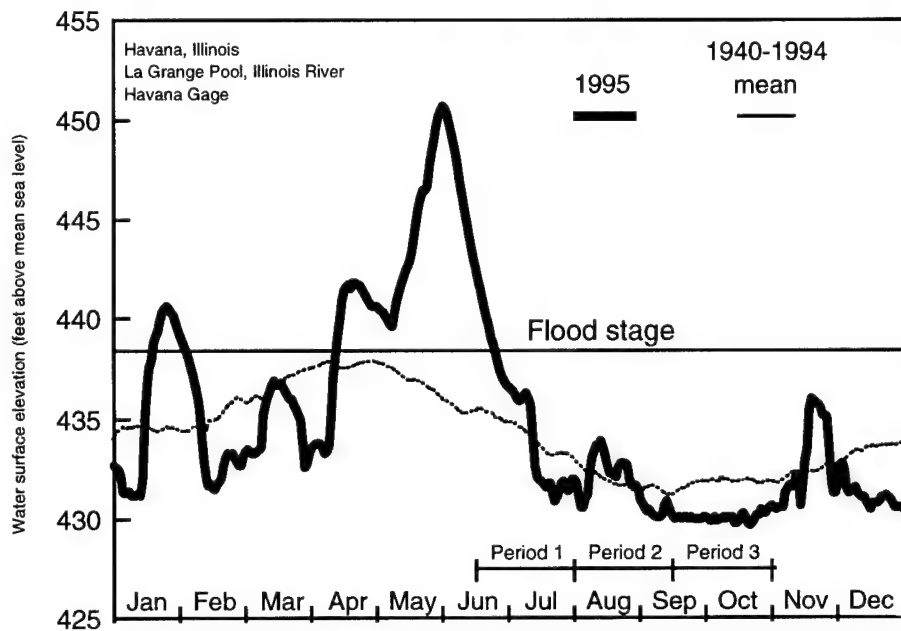


Figure 6.1. Daily water surface elevation from Havana Gage for La Grange Pool, Illinois River, during 1995 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained from the Environmental Management Technical Center (Wlosinski et al. 1995).

Summary of Sampling Effort

We made 565 collections in 1995—188 in period 1, 189 in period 2, and 188 in period 3 (Table 6.1). Of those, 434 were from randomly selected sites in the BWCS, BWCO, SCB, and MCBU strata. Of the 131 collections from fixed sites, 95 were from two TWZ fixed sites and 36 were from one SCB fixed site. In 1995, we added a TWZ stratum below La Grange Lock and Dam, and data were combined with those from Peoria Lock and Dam for this report.

Total Catch by Gear

Historical records indicate 115 fish species and 3 hybrid crosses have been collected from La Grange Pool since the late 1800s (Smith 1979). In 1995, we collected 102,419 fish representing 68 species and 4 hybrid crosses (Table 6.2). Three species were new records for LTRMP sampling in La Grange Pool (bighead carp, blacknose dace, and rock bass). The five most abundant species numerically were gizzard shad (65,988), common carp (6,197), bluegill (5,517), emerald shiner (4,677), and white bass (3,975). Total species collected, excluding hybrids, by gear type were 60 by day and night electrofishing combined, 38 by fyke netting, 28 by tandem fyke netting, 53 by mini fyke netting, 21 by tandem mini fyke netting, 39 by seining, 18 by small hoop netting, 21 by large hoop netting, and 12 by trawling. Our combined catch for 1990 through 1995 consisted of 271,693 fish representing 78 species and 5 hybrids.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

For day electrofishing (Table 6.3.1), gizzard shad had the highest poolwide mean catch-per-unit-effort (*C/f*) of 198.61, followed by common carp (12.78) and bluegill (8.51). Gizzard shad also had the highest *C/f* in the BWCS (139.46), MCBU (229.53), and SCB (60.39) strata. Species with second and third highest *C/f* by stratum were bluegill (29.70) and common carp (27.89) in the BWCS, freshwater drum (8.64) and common carp (5.78) in the MCBU, and common carp (34.42) and freshwater drum (5.53) in the SCB. Night electrofishing was not conducted at random sites in 1995.

Fyke Net

Poolwide mean *C/f* for fyke netting (Table 6.3.2), based solely on BWCS collections, was highest for white bass (28.79), followed by bluegill (26.99) and black crappie (26.33).

Tandem Fyke Net

Poolwide mean *C/f* for tandem fyke netting (Table 6.3.3), based solely on BWCO collections, was highest for gizzard shad (21.52), followed by white bass (8.60) and black crappie (7.54).

Mini Fyke Net

For mini fyke nets (Table 6.3.4), gizzard shad had the highest poolwide mean *C/f* (297.69), followed by emerald shiner (64.03) and bluegill (18.31). Gizzard shad also had the highest *C/f* in the BWCS (85.42), MCBU (382.31), and SCB (204.88) strata. The second and third highest *C/f* by stratum were bluegill (49.69) and freshwater drum (9.69) in the BWCS, emerald shiner (90.63) and freshwater drum (20.87) in the MCBU, and emerald shiner (17.44) and bluegill (10.59) in the SCB.

Tandem Mini Fyke Net

Poolwide mean *C/f* for tandem mini fyke netting (Table 6.3.5), based solely on BWCO collections, was highest for gizzard shad (17.55), followed by freshwater drum (9.92) and bluegill (9.64).

Small Hoop Net

For small hoop nets (Table 6.3.6), channel catfish had the highest poolwide mean *C/f* (4.03), followed by common carp (3.70) and smallmouth buffalo (0.42). In the BWCO stratum, common carp had the highest *C/f* (1.38), followed by channel catfish (1.13) and bluegill (0.75). Channel catfish had the highest *C/f* in both MCBU (5.54) and SCB (12.52) strata, followed by common carp (MCBU, 5.25; SCB, 5.25) and smallmouth buffalo (MCBU, 0.27; SCB, 0.21).

Large Hoop Net

For large hoop nets (Table 6.3.7), common carp had the highest poolwide mean *C/f* (8.27), followed by smallmouth buffalo (3.95) and gizzard shad (0.84). In the BWCO stratum, smallmouth buffalo had the highest *C/f* (3.99), followed by common carp (2.21) and gizzard shad (1.87). Common carp had the highest *C/f* in both MCBU (12.52) and SCB (9.13) strata, followed by smallmouth buffalo (MCBU, 3.91; SCB, 4.02). Freshwater drum had the third highest *C/f* (1.05) in the MCBU stratum, whereas channel catfish was third highest (1.09) in the SCB stratum.

Seine

Gizzard shad had the highest poolwide mean *C/f* (175.81) for seining (Table 6.3.8), followed by emerald shiners (26.00) and freshwater drum (2.44). The *C/f* in all strata was also highest for gizzard shad (BWCS, 48.04; MCBU, 223.19; and SCB, 174.25), followed by emerald shiner (BWCS, 8.04; MCBU, 33.72; and SCB, 9.63). Bluegill had the third highest *C/f* in the BWCS (4.63) stratum, and freshwater drum had the third highest in MCBU (2.78) and SCB (9.21) strata.

Fixed Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

Common carp had the highest mean *C/f* (36.67) for day electrofishing (Table 6.4.1) at the SCB fixed site, followed by gizzard shad (36.00) and bluegill (26.50). At the TWZ stratum, gizzard shad dominated the catch (1,134.33), followed by white bass (51.33) and common carp (43.25).

Night Electrofishing

For night electrofishing at the SCB stratum (Table 6.4.2), common carp had the highest *C/f* (38.29), followed by bluegill (22.38) and gizzard shad (19.96). Gizzard shad had the highest *C/f* (455.36) at the TWZ stratum, followed by white bass (62.36) and common carp (45.45).

Fyke Net

White bass had the highest *C/f* (45.37) in the TWZ fyke nets (Table 6.4.3), followed by black crappie (33.76) and white crappie (18.35).

Mini Fyke Net

For mini fyke netting at the SCB stratum (Table 6.4.4), gizzard shad had the highest *C/f* (25.19), followed by freshwater drum (9.01) and golden shiner (5.38). At the TWZ stratum, freshwater drum had the highest *C/f* (28.88), followed by gizzard shad (12.45) and white bass (8.29).

Small Hoop Net

Common carp had the highest *C/f* (4.74) for small hoop nets at the SCB stratum (Table 6.4.5), followed by channel catfish (0.40) and flathead catfish (0.20). At the TWZ stratum, channel catfish had the highest *C/f* (10.31), followed by common carp (7.03) and white bass (0.42).

Large Hoop Net

Common carp had the highest *C/f* (2.41) for large hoop nets at the SCB stratum (Table 6.4.6), followed by freshwater drum (1.35) and smallmouth buffalo (0.92). At the TWZ stratum, smallmouth buffalo had the highest *C/f* (11.71), followed by common carp (8.10) and white bass (1.34).

Seine

For SCB seining (Table 6.4.7), gizzard shad (49.67) had the highest *C/f*, followed by emerald shiner (10.83) and freshwater drum (2.42).

Trawl

Freshwater drum (2.63) had the highest *C/f* in the TWZ trawls (Table 6.4.8), followed by gizzard shad (1.92) and channel catfish (1.83).

Length Distributions of Selected Species

Gizzard Shad

Gizzard shad production was exceptional in 1995 as the total catch of 34,550 fish from day and night electrofishing combined illustrates (Table 6.2). The electrofishing length distribution contains data from 11,427 fish, which were measured and grouped into 1-cm categories per standard LTRMP methods (Gutreuter et al. 1995). A majority of the catch consisted of fish less than 7 cm with some larger fish present (Figure 6.2). A total of 23,123 fish were not measured individually and were not included in our length distributions. Ninety-nine percent of the unmeasured fish were 3–13 cm.

Common Carp

The electrofishing length distribution from 3,811 common carp (Figure 6.3) indicates abundant fish from 30 to 50 cm with relatively few fish outside this range. Some fish less than 10 cm were present, as were some greater than 50 cm. A total of 130 fish were not measured individually and were not included in our length distributions.

Smallmouth Buffalo

Most of the 912 smallmouth buffalo we collected electrofishing in 1995 (Figure 6.4) were 20 to 30 cm long. Smaller numbers of fish were grouped around 10 and 35 cm.

Hoop net length distributions of 749 smallmouth buffalo also showed the group at 20 to 30 cm and a strong grouping from 32 to 44 cm (Figure 6.5).

Channel Catfish

The electrofishing length distribution of 251 channel catfish showed two abundant groups from 4 to 6 cm and from 18 to 26 cm (Figure 6.6). Electrofishing collections showed a wide range of sizes and many cohorts.

Channel catfish from 16 to 25 cm dominated the length distribution from hoop nets in 1995 (Figure 6.7). Some of the 1,090 fish in the distribution were greater than 40 cm, but no fish less than 10 cm were collected by hoop nets.

Northern Pike

No northern pike were collected during electrofishing in 1995, but two northern pike (about 68 and 74 cm long) were collected in fyke and tandem fyke nets (Table 6.2). This species continues to be a rare occurrence in our collections in La Grange Pool.

White Bass

Several peaks were evident in the distribution of 1,759 white bass collected with electrofishing in 1995 (Figure 6.8). The first group of fish was at 9 cm, with other peaks around 18 and 27 cm. Six fish were not measured individually and were not included in our length distribution.

Bluegill

We collected 1,945 bluegill during electrofishing in 1995 (Figure 6.9) of which 161 from 3 to 7 cm were not individually measured and 95 were unmeasured; these fish were not included in the length distribution. Fish were relatively evenly distributed from 3 to 16 cm, but none were greater than 20 cm.

We combined catches from fyke and tandem fyke net sets in a length distribution of 994 bluegill (Figure 6.10). The distribution was similar to that for electrofishing (Figure 6.9), with even distribution of fish from 9 to 16 cm and the absence of the smaller fish.

Largemouth Bass

The electrofishing length distribution from 574 largemouth bass (Figure 6.11) indicated fish were distributed from 3 to 40 cm, but peaks were evident at 8, 24, and 39 cm.

White Crappie

The majority of the 509 white crappie from fyke and tandem fyke nets (Figure 6.12) were from 18 to 22 cm. We had 77 unmeasured fish that were not included in the length distribution.

Black Crappie

We collected 1,360 black crappie in fyke and tandem fyke nets in 1995 (Figure 6.13); of these, 69 were unmeasured and not included in the length distribution. Most of the fish collected were from 12 to 24 cm, with a small peak of fish around 8 cm.

Sauger

We collected 122 sauger during electrofishing in 1995 (Figure 6.14). Peaks in the distribution were at 8, 12, 18, and 34 cm, with several fish in the catch exceeding 50 cm.

Walleye

Four walleye were collected during electrofishing in 1995 (Table 6.2). Seven others were collected with other gears. Although length distributions were not constructed for this report, walleye lengths from all gears ranged from 5 to 44 cm.

Freshwater Drum

Many of the 889 freshwater drum in the electrofishing length distribution (Figure 6.15) were less than 13 cm long, with relatively even percentages of fish from 15 to 35 cm. Ninety-five fish from 6 to 12 cm long were not individually measured and were not included in the length distribution.

We collected 495 freshwater drum in fyke and tandem fyke nets. These fish were distributed from about 10 to 40 cm, with a peak at 20 cm (Figure 6.16).

Table 6.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in the La Grange Pool of the Illinois River during 1995. Table entries are numbers of successfully completed standardized monitoring collections. Table page: 1

Sampling period=1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		14	12					4	42
Fyke net	10								4	14
Large hoop net		4	8	8					4	24
Small hoop net		4	8	8					4	24
Mini fyke net	10		8	8					4	30
Night electrofishing			2						4	6
Seine	8		12	12						32
Trawling									8	8
Tandem fyke net		4								4
Tandem mini fyke net		4								4
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SUBTOTAL	40	16	52	48	0	0	0	0	32	188

Sampling period=2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	13		14	12					4	43
Fyke net	10								4	14
Large hoop net		4	8	7					4	23
Small hoop net		4	8	8					4	24
Mini fyke net	10		10	8					4	32
Night electrofishing			2						3	5
Seine	8		12	12						32
Trawling									8	8
Tandem fyke net		4								4
Tandem mini fyke net		4								4
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SUBTOTAL	41	16	54	47	0	0	0	0	31	189

Sampling period=3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		14	12					4	42
Fyke net	10								4	14
Large hoop net		4	8	8					4	24
Small hoop net		4	8	8					4	24
Mini fyke net	10		8	8					4	30
Night electrofishing			2						4	6
Seine	8		12	12						32
Trawling									8	8
Tandem fyke net		4								4
Tandem mini fyke net		4								4
	----	----	---	----	----	----	----	---	---	-----
SUBTOTAL	40	16	52	48	0	0	0	0	32	188
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
	121	48	158	143	0	0	0	0	95	565

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SBU - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in the La Grange Pool of the Illinois River. See Table 6.1 for the list of sampling gears actually deployed in this study reach. Table page: 1

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Paddlefish	Polyodon spathula	-	1	-	-	-	-	-	-	-	-	-	-	1
2	Spotted gar	Lepisosteus oculatus	-	-	4	-	2	-	-	-	-	-	-	-	6
3	Longnose gar	Lepisosteus osseus	15	-	4	2	7	-	1	-	-	-	-	-	29
4	Shortnose gar	Lepisosteus platostomus	39	22	238	26	114	2	6	2	4	-	-	-	453
5	Bowfin	Amia calva	3	-	10	2	3	-	-	-	-	-	-	-	18
6	Goldeye	Hiodon alosoides	51	8	4	-	-	-	-	-	2	-	-	-	65
7	American eel	Anguilla rostrata	-	-	1	-	-	-	-	-	-	-	-	-	1
8	Skipjack herring	Alosa chrysochloris	42	-	6	1	1	-	3	-	1	-	-	-	54
9	Gizzard shad	Dorosoma cepedianum	29425	5125	397	520	16010	418	13966	3	78	-	-	46	65988
10	Threadfin shad	Dorosoma petenense	12	-	6	2	16	7	29	-	-	-	-	-	72
11	Central stoneroller	Camptostoma anomalum	-	-	-	-	-	-	2	-	-	-	-	-	3
12	Goldfish	Carassius auratus	27	2	1	2	3	-	-	-	-	-	-	-	35
13	Grass carp	Ctenopharyngodon idella	8	-	-	-	-	-	-	-	-	-	-	-	8
14	Red shiner	Cyprinella lutrensis	25	5	-	-	74	-	33	-	-	-	-	-	137
15	Common carp	Cyprinus carpio	3218	723	182	13	130	12	29	697	1174	-	-	19	6197
16	Goldfish x carp	Carassius auratus x C. carpio	16	9	3	-	-	-	-	1	1	-	-	-	30
17	Bighead carp	Hypophthalmichthys nobilis	-	-	1	-	-	-	-	-	-	-	-	-	1
18	Silver chub	Macrhybopsis storeriana	5	-	-	-	5	-	23	1	-	-	-	1	35
19	Golden shiner	Notemigonus crysoleucas	91	9	3	1	256	7	60	-	-	-	-	-	427
20	Emerald shiner	Notropis atherinoides	352	36	-	-	2519	2	1768	-	-	-	-	-	4677
21	Spottail shiner	Notropis hudsonius	3	-	-	-	8	1	1	-	-	-	-	-	13
22	Silverband shiner	Notropis shumardi	-	1	-	-	3	-	-	-	-	-	-	-	4
23	Bluntnose minnow	Pimephales notatus	6	-	-	-	11	-	1	-	-	-	-	-	18
24	Fathead minnow	Pimephales promelas	-	-	-	-	1	-	1	-	-	-	-	-	2
25	Bullhead minnow	Pimephales vigilax	9	1	-	-	20	3	33	-	-	-	-	-	66
26	Blacknose dace	Rhinichthys atratulus	-	-	-	-	1	-	-	-	-	-	-	-	1
27	River carpsucker	Carpododes carpio	106	16	92	22	4	1	39	2	36	-	-	-	318
28	Quillback	Carpododes cyprinus	3	-	4	1	1	-	-	-	-	-	-	-	9
29	Highfin carpsucker	Carpododes velifer	1	-	-	-	-	-	-	-	-	-	-	-	1
30	Smallmouth buffalo	Ictiobus bubalus	675	237	213	31	36	2	43	41	708	-	-	-	1986
31	Bigmouth buffalo	Ictiobus cyprinellus	443	83	8	-	22	-	59	-	3	-	-	1	619
32	Black buffalo	Ictiobus niger	47	15	-	4	3	-	2	-	27	-	-	-	98
33	Silver redhorse	Moxostoma anisurum	1	-	1	-	-	-	1	-	1	-	-	-	4
34	Golden redhorse	Moxostoma erythrurum	7	-	2	1	1	-	6	-	-	-	-	1	18
35	Shorthead redhorse	Moxostoma macrolepidotum	125	21	120	42	34	-	10	1	5	-	-	6	364
36	Black bullhead	Ameiurus melas	18	-	26	8	80	4	-	3	3	-	-	-	142
37	Yellow bullhead	Ameiurus natalis	37	-	26	9	89	9	1	3	1	-	-	-	175
38	Brown bullhead	Ameiurus nebulosus	7	-	163	13	21	-	-	17	23	-	-	-	244
39	Channel catfish	Ictalurus punctatus	244	7	42	11	131	4	8	1009	81	-	-	44	1581

Gears: D - Day electrofishing S - Seining
N - Night electrofishing HS - Small hoop netting
F - Fyke netting HL - Large hoop netting
X - Tandem fyke netting G - Gill netting
M - Mini fyke netting TA - Trammel netting, anchored sets
Y - Tandem mini fyke netting T - Trawling (4.8-m bottom trawl)

Table 6.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1995 in the La Grange Pool of the Illinois River. See Table 6.1 for the list of sampling gears actually deployed in this study reach.

Table page: 2

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Tadpole madtom	Noturus gyrinus	1	-	-	-	-	-	-	-	-	-	-	-	1
41	Flathead catfish	Pylodictis olivaris	44	13	8	-	9	-	-	13	18	-	-	2	107
42	Grass pickerel	Esox americanus vermiculatus	6	-	-	-	-	-	1	-	-	-	-	-	7
43	Northern pike	Esox lucius	-	-	1	1	-	-	-	-	-	-	-	-	2
44	Pirate perch	Aphredoderus sayanus	1	-	-	-	1	-	-	-	-	-	-	-	2
45	Blackstripe topminnow	Fundulus notatus	5	-	-	-	7	-	7	-	-	-	-	-	19
46	Western mosquitofish	Gambusia affinis	8	-	-	-	73	-	84	-	-	-	-	-	165
47	Brook silverside	Labidesthes sicculus	14	1	-	-	5	3	45	-	-	-	-	-	68
48	White perch	Morone americana	3	1	2	1	-	-	-	-	-	-	-	-	7
49	White bass	Morone chrysops	1060	705	1402	206	420	12	96	18	51	-	-	5	3975
50	Yellow bass	Morone mississippiensis	57	19	21	5	2	-	-	2	2	-	-	-	108
51	Striped bass	Morone saxatilis	1	-	1	-	-	-	-	-	-	-	-	-	2
52	White x striped bass	M. chrysops x M. saxatilis	5	6	5	1	-	-	-	-	1	-	-	-	18
53	Rock bass	Ambloplites rupestris	1	1	-	-	-	-	-	-	-	-	-	-	2
54	Green sunfish	Lepomis cyanellus	46	4	1	-	23	-	-	-	-	-	-	-	74
55	Pumpkinseed	Lepomis gibbosus	2	2	2	-	-	-	-	-	-	-	-	-	6
56	Warmouth	Lepomis gulosus	43	2	4	-	3	2	-	-	-	-	-	-	54
57	Orangespotted sunfish	Lepomis humilis	16	1	2	-	20	-	-	-	-	-	-	-	39
58	Bluegill	Lepomis macrochirus	1703	242	959	130	1906	229	326	19	3	-	-	-	5517
59	Redear sunfish	Lepomis microlophus	5	-	-	-	1	-	-	-	-	-	-	-	6
60	Green sunfish x bluegill	L. cyanellus x L. macrochirus	10	1	4	-	3	-	-	-	-	-	-	-	18
61	Warmouth x bluegill	L. gulosus x L. macrochirus	-	-	1	-	-	-	-	-	-	-	-	-	1
62	Smallmouth bass	Micropterus dolomieu	2	6	-	-	-	-	-	-	-	-	-	-	8
63	Largemouth bass	Micropterus salmoides	523	51	14	-	34	-	45	-	-	-	-	-	667
64	White crappie	Pomoxis annularis	533	124	507	79	95	6	19	9	20	-	-	1	1393
65	Black crappie	Pomoxis nigromaculatus	579	97	1180	180	171	4	19	4	11	-	-	-	2245
66	Mud darter	Etheostoma asprigene	17	-	-	-	70	-	4	-	-	-	-	-	91
67	Johnny darter	Etheostoma nigrum	2	-	-	-	67	-	5	-	-	-	-	-	74
68	Yellow perch	Perca flavescens	-	-	-	-	1	-	-	-	-	-	-	-	1
69	Logperch	Percina caprodes	28	2	-	-	51	2	3	-	-	-	-	-	86
70	Sauger	Stizostedion canadense	88	34	21	9	24	-	7	-	3	-	-	5	191
71	Walleye	Stizostedion vitreum	5	2	2	-	-	-	2	-	-	-	-	-	11
72	Freshwater drum	Aplodinotus grunniens	828	156	407	88	1288	242	358	18	106	-	-	63	3554
			40697	7791	6101	1411	23881	972	17146	1863	2363	0	0	194	102419

Gears: D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting

S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 6.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.15 (0.12)		0.03 (0.03)			0.19 (0.17)		0.17 (0.07)		
Shortnose gar	0.31 (0.14)		0.16 (0.09)			0.36 (0.20)		0.33 (0.11)		
Bowfin	0.02 (0.02)		0.08 (0.06)							
Goldeye	0.18 (0.09)					0.25 (0.13)		0.11 (0.07)		
Skipjack herring	0.58 (0.27)					0.83 (0.40)		0.06 (0.04)		
Gizzard shad	198.61 (41.46)		139.46 (49.37)			229.53 (56.77)		60.39 (13.52)		
Threadfin shad	0.03 (0.02)		0.03 (0.03)			0.03 (0.03)		0.03 (0.03)		
Goldfish	0.17 (0.06)		0.51 (0.23)			0.06 (0.04)		0.08 (0.06)		
Grass carp	0.02 (0.01)		0.05 (0.04)					0.14 (0.06)		
Red shiner	0.09 (0.04)		0.19 (0.13)			0.03 (0.03)		0.42 (0.21)		
Common carp	12.78 (1.55)		27.89 (4.66)			5.78 (1.38)		34.42 (5.57)		
Goldfish x carp	0.05 (0.02)		0.19 (0.08)					0.06 (0.04)		
Silver chub	0.02 (0.02)					0.03 (0.03)		0.11 (0.09)		
Golden shiner	0.47 (0.17)		1.65 (0.66)			0.03 (0.03)		0.50 (0.25)		
Emerald shiner	3.05 (0.86)		2.30 (1.17)			3.31 (1.16)		3.44 (1.22)		
Spottail shiner	0.02 (0.02)		0.08 (0.06)							
Bluntnose minnow	0.03 (0.03)		0.11 (0.11)					0.06 (0.04)		
Bullhead minnow	0.06 (0.04)		0.05 (0.04)			0.06 (0.06)		0.14 (0.06)		
River carpsucker	1.24 (0.44)		0.78 (0.22)			1.44 (0.63)		0.61 (0.16)		
Quillback	0.01 (0.01)		0.05 (0.04)							
Highfin carpsucker	0.01 (0.01)		0.03 (0.03)							
Smallmouth buffalo	3.74 (0.57)		9.24 (1.64)			1.67 (0.55)		4.33 (1.02)		
Bigmouth buffalo	1.76 (0.40)		5.32 (1.51)			0.25 (0.13)		4.58 (1.64)		
Black buffalo	0.15 (0.04)		0.38 (0.13)			0.03 (0.03)		0.69 (0.31)		
Silver redhorse	0.01 (0.01)		0.03 (0.03)							
Golden redhorse	0.02 (0.01)		0.05 (0.05)					0.06 (0.04)		
Shorthead redhorse	0.64 (0.18)		1.30 (0.47)			0.39 (0.18)		0.75 (0.23)		
Black bullhead	0.14 (0.06)		0.46 (0.20)			0.03 (0.03)				
Yellow bullhead	0.28 (0.13)		0.86 (0.47)			0.08 (0.05)		0.06 (0.06)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Brown bullhead	0.05 (0.02)		0.19 (0.09)							
Channel catfish	1.86 (0.47)		1.97 (0.58)			1.78 (0.64)		2.42 (0.47)		
Tadpole madtom	0.01 (0.01)		0.03 (0.03)							
Flathead catfish	0.17 (0.05)		0.27 (0.11)			0.11 (0.05)		0.44 (0.16)		
Grass pickerel	0.05 (0.03)		0.11 (0.06)			0.03 (0.03)		0.03 (0.03)		
Pirate perch	0.01 (0.01)		0.03 (0.03)							
Blackstripe topminnow	0.02 (0.02)		0.08 (0.06)							
Western mosquitofish	0.06 (0.04)		0.22 (0.17)							
Brook silverside	0.09 (0.03)		0.19 (0.08)			0.06 (0.04)		0.03 (0.03)		
White perch	0.02 (0.02)					0.03 (0.03)				
White bass	4.60 (0.92)		2.59 (0.83)			5.44 (1.29)		3.03 (0.42)		
Yellow bass	0.02 (0.02)		0.08 (0.06)					0.08 (0.06)		
Striped bass								0.03 (0.03)		
Green sunfish	0.23 (0.10)		0.86 (0.39)					0.06 (0.04)		
Warmouth	0.27 (0.09)		1.03 (0.36)					0.03 (0.03)		
Orangespotted sunfish	0.11 (0.04)		0.32 (0.13)			0.03 (0.03)		0.08 (0.05)		
Bluegill	8.51 (1.74)		29.70 (6.76)			0.89 (0.25)		5.11 (0.83)		
Redear sunfish	0.03 (0.01)		0.11 (0.05)							
Green sunfish x bluegill	0.02 (0.01)		0.05 (0.05)					0.06 (0.06)		
Largemouth bass	2.91 (0.37)		9.24 (1.34)			0.61 (0.18)		2.22 (0.52)		
White crappie	1.32 (0.25)		4.22 (0.96)			0.19 (0.09)		2.11 (0.50)		
Black crappie	2.70 (0.48)		8.92 (1.82)			0.36 (0.14)		3.31 (0.76)		
Mud darter	0.12 (0.12)		0.46 (0.46)							
Johnny darter	0.01 (0.01)		0.03 (0.03)							
Logperch	0.19 (0.10)		0.57 (0.36)			0.06 (0.04)		0.06 (0.04)		
Sauger	0.98 (0.22)		0.49 (0.26)			1.19 (0.31)		0.42 (0.12)		
Walleye	0.08 (0.08)					0.11 (0.11)		0.03 (0.03)		
Freshwater drum	8.01 (1.49)		6.76 (1.87)			8.64 (2.03)		5.53 (1.07)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Spotted gar	0.14 (0.08)		0.14 (0.08)							
Longnose gar	0.14 (0.11)		0.14 (0.11)							
Shortnose gar	6.97 (3.05)		6.97 (3.06)							
Bowfin	0.33 (0.18)		0.33 (0.18)							
Goldeye	0.06 (0.06)		0.06 (0.06)							
American eel	0.03 (0.03)		0.03 (0.03)							
Skipjack herring	0.17 (0.11)		0.17 (0.11)							
Gizzard shad	6.73 (1.49)		6.73 (1.50)							
Threadfin shad	0.10 (0.05)		0.10 (0.06)							
Common carp	3.38 (1.14)		3.38 (1.15)							
Goldfish x carp	0.10 (0.06)		0.10 (0.06)							
Bighead carp	0.03 (0.03)		0.03 (0.03)							
Golden shiner	0.03 (0.03)		0.03 (0.03)							
River carpsucker	2.70 (0.91)		2.70 (0.91)							
Quillback	0.10 (0.06)		0.10 (0.06)							
Smallmouth buffalo	4.90 (1.28)		4.90 (1.28)							
Bigmouth buffalo	0.27 (0.15)		0.27 (0.15)							
Silver redhorse	0.03 (0.03)		0.03 (0.03)							
Golden redhorse	0.04 (0.03)		0.04 (0.04)							
Shorthead redhorse	1.67 (0.97)		1.67 (0.97)							
Black bullhead	0.83 (0.41)		0.83 (0.41)							
Yellow bullhead	0.91 (0.43)		0.91 (0.43)							
Brown bullhead	5.55 (4.02)		5.55 (4.04)							
Channel catfish	0.77 (0.22)		0.77 (0.22)							
Flathead catfish	0.07 (0.05)		0.07 (0.05)							
White perch	0.07 (0.07)		0.07 (0.07)							
White bass	28.79 (14.32)		28.79 (14.38)							
Yellow bass	0.50 (0.21)		0.50 (0.21)							
Striped x white bass	0.07 (0.05)		0.07 (0.05)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Pumpkinseed	0.03 (0.03)		0.03 (0.03)							
Warmouth	0.14 (0.11)		0.14 (0.11)							
Orangespotted sunfish	0.04 (0.04)		0.04 (0.04)							
Bluegill	26.99 (11.02)		26.99 (11.07)							
Green sunfish x bluegill	0.14 (0.08)		0.14 (0.08)							
Bluegill x warmouth	0.04 (0.04)		0.04 (0.04)							
Largemouth bass	0.37 (0.14)		0.37 (0.14)							
White crappie	9.76 (3.37)		9.76 (3.39)							
Black crappie	26.33 (5.96)		26.33 (5.98)							
Sauger	0.43 (0.19)		0.43 (0.19)							
Walleye	0.03 (0.03)		0.03 (0.03)							
Freshwater drum	7.65 (1.73)		7.65 (1.74)							

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name ^s	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.08 (0.05)	0.08 (0.05)								
Shortnose gar	1.05 (0.57)	1.05 (0.57)								
Bowfin	0.08 (0.06)	0.08 (0.06)								
Skipjack herring	0.04 (0.04)	0.04 (0.04)								
Gizzard shad	21.52 (6.21)	21.52 (6.21)								
Threadfin shad	0.08 (0.08)	0.08 (0.08)								
Goldfish	0.09 (0.09)	0.09 (0.09)								
Common carp	0.55 (0.17)	0.55 (0.17)								
Golden shiner	0.04 (0.04)	0.04 (0.04)								
River carpsucker	0.93 (0.40)	0.93 (0.40)								
Quillback	0.04 (0.04)	0.04 (0.04)								
Smallmouth buffalo	1.33 (0.92)	1.33 (0.92)								
Black buffalo	0.17 (0.17)	0.17 (0.17)								
Golden redhorse	0.04 (0.04)	0.04 (0.04)								
Shorthead redhorse	1.75 (0.94)	1.75 (0.94)								
Black bullhead	0.34 (0.26)	0.34 (0.26)								
Yellow bullhead	0.37 (0.15)	0.37 (0.15)								
Brown bullhead	0.55 (0.33)	0.55 (0.33)								
Channel catfish	0.47 (0.22)	0.47 (0.22)								
Northern pike	0.04 (0.04)	0.04 (0.04)								
White perch	0.04 (0.04)	0.04 (0.04)								
White bass	8.60 (4.05)	8.60 (4.05)								
Yellow bass	0.21 (0.10)	0.21 (0.10)								
Striped x white bass	0.04 (0.04)	0.04 (0.04)								
Bluegill	5.44 (1.80)	5.44 (1.80)								
White crappie	3.27 (0.79)	3.27 (0.79)								
Black crappie	7.54 (2.80)	7.54 (2.80)								
Sauger	0.37 (0.21)	0.37 (0.21)								
Freshwater drum	3.72 (1.21)	3.72 (1.21)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.16 (0.10)		0.07 (0.07)			0.21 (0.13)				
Shortnose gar	1.29 (0.67)		2.57 (2.29)			0.86 (0.46)		0.45 (0.15)		
Bowfin	0.03 (0.02)		0.10 (0.07)							
Gizzard shad	297.69 (143.70)		85.42 (44.76)			382.31 (205.46)		204.88 (197.81)		
Threadfin shad	0.25 (0.17)		0.03 (0.03)			0.34 (0.24)		0.10 (0.10)		
Central stoneroller	0.03 (0.03)					0.04 (0.04)				
Goldfish	0.05 (0.03)		0.07 (0.05)			0.04 (0.04)				
Red shiner	1.63 (0.88)		0.30 (0.27)			2.21 (1.26)		0.21 (0.12)		
Common carp	2.21 (0.97)		1.43 (0.50)			2.59 (1.38)		0.81 (0.48)		
Silver chub	0.10 (0.07)					0.13 (0.10)		0.10 (0.07)		
Golden shiner	1.68 (1.15)		5.53 (4.46)			0.17 (0.08)		2.85 (2.23)		
Emerald shiner	64.03 (26.71)		0.37 (0.15)			90.63 (38.38)		17.44 (12.42)		
Spottail shiner	0.17 (0.10)					0.25 (0.15)				
Silverband shiner	0.04 (0.03)		0.03 (0.03)			0.04 (0.04)				
Bluntnose minnow	0.23 (0.22)		0.07 (0.07)			0.31 (0.31)		0.05 (0.05)		
Fathead minnow	0.03 (0.03)					0.04 (0.04)				
Bullhead minnow	0.30 (0.11)		0.47 (0.20)			0.25 (0.14)				
Blacknose dace	0.03 (0.03)					0.04 (0.04)				
River carpsucker	0.05 (0.03)		0.07 (0.05)			0.04 (0.04)		0.05 (0.05)		
Quillback	0.01 (0.01)		0.03 (0.03)							
Smallmouth buffalo	0.39 (0.16)		0.94 (0.52)			0.21 (0.13)		0.10 (0.10)		
Bigmouth buffalo	0.28 (0.12)		0.54 (0.37)			0.21 (0.11)				
Black buffalo								0.10 (0.10)		
Golden redhorse	0.01 (0.01)		0.03 (0.03)							
Shorthead redhorse	0.34 (0.20)		0.83 (0.73)			0.17 (0.10)		0.15 (0.11)		
Black bullhead	0.65 (0.32)		1.62 (1.03)			0.34 (0.26)				
Yellow bullhead	0.87 (0.33)		2.24 (1.04)			0.42 (0.27)				
Brown bullhead	0.18 (0.12)		0.72 (0.46)							
Channel catfish	1.38 (0.28)		0.74 (0.34)			1.56 (0.37)		2.17 (0.93)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Flathead catfish	0.14 (0.07)		0.07 (0.05)			0.17 (0.10)		0.05 (0.05)		
Pirate perch	0.01 (0.01)		0.04 (0.04)							
Blackstripe topminnow	0.05 (0.04)		0.20 (0.14)					0.05 (0.05)		
Western mosquitofish	1.00 (0.43)		1.45 (1.41)			0.89 (0.32)		0.16 (0.12)		
Brook silverside	0.08 (0.04)		0.07 (0.05)			0.09 (0.06)				
White bass	5.14 (1.54)		2.80 (2.09)			6.09 (2.08)		3.78 (2.29)		
Yellow bass	0.01 (0.01)		0.03 (0.03)							
Green sunfish	0.26 (0.10)		0.34 (0.14)			0.25 (0.14)				
Warmouth	0.05 (0.03)		0.07 (0.05)			0.04 (0.04)				
Orangespotted sunfish	0.13 (0.09)		0.48 (0.35)					0.05 (0.05)		
Bluegill	18.31 (11.33)		49.69 (41.69)			7.20 (5.32)		10.59 (9.29)		
Redear sunfish	0.01 (0.01)		0.03 (0.03)							
Green sunfish x bluegill	0.05 (0.03)		0.07 (0.07)			0.04 (0.04)				
Largemouth bass	0.46 (0.17)		0.65 (0.26)			0.41 (0.22)		0.20 (0.09)		
White crappie	0.91 (0.28)		1.07 (0.29)			0.86 (0.39)		0.85 (0.45)		
Black crappie	1.24 (0.38)		3.31 (1.40)			0.51 (0.19)		0.71 (0.47)		
Mud darter	1.16 (0.83)		1.27 (1.17)			1.20 (1.11)				
Johnny darter	0.64 (0.50)		2.00 (1.93)			0.17 (0.13)		0.10 (0.10)		
Yellow perch	0.01 (0.01)		0.03 (0.03)							
Logperch	0.86 (0.36)		0.68 (0.40)			0.97 (0.50)		0.10 (0.07)		
Sauger	0.18 (0.06)		0.10 (0.07)			0.22 (0.09)		0.09 (0.09)		
Freshwater drum	17.29 (10.33)		9.69 (5.43)			20.87 (14.71)		5.63 (1.93)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.08 (0.06)	0.08 (0.06)								
Gizzard shad	17.55 (10.11)	17.55 (10.12)								
Threadfin shad	0.29 (0.29)	0.29 (0.29)								
Common carp	0.50 (0.25)	0.50 (0.25)								
Golden shiner	0.29 (0.25)	0.29 (0.25)								
Emerald shiner	0.08 (0.06)	0.08 (0.06)								
Spottail shiner	0.04 (0.04)	0.04 (0.04)								
Bullhead minnow	0.12 (0.06)	0.12 (0.06)								
River carpsucker	0.04 (0.04)	0.04 (0.04)								
Smallmouth buffalo	0.09 (0.08)	0.09 (0.09)								
Black bullhead	0.17 (0.11)	0.17 (0.11)								
Yellow bullhead	0.36 (0.32)	0.36 (0.32)								
Channel catfish	0.17 (0.13)	0.17 (0.13)								
Brook silverside	0.12 (0.12)	0.12 (0.12)								
White bass	0.50 (0.30)	0.50 (0.30)								
Warmouth	0.08 (0.06)	0.08 (0.06)								
Bluegill	9.64 (8.42)	9.64 (8.43)								
White crappie	0.25 (0.14)	0.25 (0.14)								
Black crappie	0.17 (0.07)	0.17 (0.07)								
Logperch	0.08 (0.08)	0.08 (0.08)								
Freshwater drum	9.92 (4.79)	9.92 (4.79)								

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.03 (0.03)	0.09 (0.09)								
Gizzard shad	0.03 (0.02)	0.04 (0.04)				0.02 (0.02)				
Common carp	3.70 (0.67)	1.38 (0.29)				5.25 (1.16)		5.25 (1.09)		
Silver chub	0.01 (0.01)					0.02 (0.02)				
River carpsucker	0.02 (0.02)	0.04 (0.04)								
Smallmouth buffalo	0.42 (0.14)	0.63 (0.26)				0.27 (0.18)		0.21 (0.10)		
Black bullhead	0.05 (0.03)	0.13 (0.07)								
Yellow bullhead	0.05 (0.03)	0.08 (0.06)				0.02 (0.02)				
Brown bullhead	0.27 (0.12)	0.67 (0.30)						0.03 (0.03)		
Channel catfish	4.03 (0.98)	1.13 (0.54)				5.54 (1.64)		12.52 (7.10)		
Flathead catfish	0.09 (0.03)					0.15 (0.05)		0.05 (0.04)		
White bass	0.08 (0.05)	0.09 (0.06)				0.08 (0.08)		0.05 (0.05)		
Yellow bass	0.03 (0.03)	0.08 (0.08)								
Bluegill	0.30 (0.19)	0.75 (0.47)						0.03 (0.03)		
White crappie	0.08 (0.05)	0.17 (0.13)				0.02 (0.02)		0.05 (0.04)		
Black crappie	0.04 (0.02)	0.08 (0.06)						0.05 (0.04)		
Freshwater drum	0.08 (0.04)	0.04 (0.04)				0.11 (0.06)		0.08 (0.04)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar	0.07 (0.04)	0.16 (0.09)								
Gizzard shad	0.84 (0.33)	1.87 (0.82)				0.15 (0.07)		0.25 (0.20)		
Common carp	8.27 (2.35)	2.21 (0.92)				12.52 (4.13)		9.13 (2.45)		
Goldfish x carp	0.02 (0.02)	0.04 (0.04)								
River carpsucker	0.20 (0.08)	0.30 (0.18)				0.13 (0.06)		0.13 (0.13)		
Smallmouth buffalo	3.95 (0.81)	3.99 (1.69)				3.91 (0.80)		4.02 (1.03)		
Black buffalo	0.13 (0.10)					0.22 (0.18)		0.19 (0.08)		
Silver redhorse	0.01 (0.01)					0.02 (0.02)				
Shorthead redhorse	0.02 (0.01)					0.02 (0.02)		0.08 (0.08)		
Black bullhead	0.05 (0.03)	0.13 (0.07)								
Yellow bullhead	0.02 (0.02)	0.04 (0.04)								
Brown bullhead	0.31 (0.11)	0.71 (0.28)				0.04 (0.03)		0.09 (0.09)		
Channel catfish	0.42 (0.12)	0.08 (0.06)				0.61 (0.21)		1.09 (0.32)		
Flathead catfish	0.10 (0.04)					0.15 (0.07)		0.28 (0.08)		
White bass	0.27 (0.15)	0.59 (0.38)				0.07 (0.05)		0.05 (0.04)		
Yellow bass	0.03 (0.02)	0.09 (0.06)								
Bluegill	0.05 (0.03)	0.12 (0.07)								
White crappie	0.16 (0.07)	0.37 (0.17)				0.02 (0.02)		0.06 (0.04)		
Black crappie	0.12 (0.07)	0.25 (0.17)				0.02 (0.02)		0.08 (0.08)		
Sauger	0.01 (0.01)					0.02 (0.02)		0.03 (0.03)		
Freshwater drum	0.71 (0.24)	0.26 (0.19)				1.05 (0.40)		0.33 (0.14)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar	0.01 (0.01)		0.04 (0.04)							
Shortnose gar	0.04 (0.03)					0.06 (0.04)		0.08 (0.08)		
Skipjack herring	0.06 (0.03)					0.08 (0.05)				
Gizzard shad	175.81 (69.49)		48.04 (23.66)			223.19 (99.42)		174.25 (76.37)		
Central stoneroller	0.02 (0.02)		0.08 (0.08)							
Red shiner	0.29 (0.11)		0.63 (0.34)			0.17 (0.09)		0.29 (0.14)		
Common carp	0.37 (0.11)		0.50 (0.23)			0.33 (0.14)		0.17 (0.08)		
Silver chub	0.35 (0.17)		0.04 (0.04)			0.47 (0.24)		0.17 (0.10)		
Golden shiner	0.19 (0.06)		0.21 (0.10)			0.11 (0.07)		1.21 (0.77)		
Emerald shiner	26.00 (9.90)		8.04 (4.89)			33.72 (14.13)		9.63 (2.43)		
Spottail shiner	0.01 (0.01)		0.04 (0.04)							
Bluntnose minnow								0.04 (0.04)		
Fathead minnow	0.02 (0.02)					0.03 (0.03)				
Bullhead minnow	0.34 (0.09)		0.75 (0.25)			0.19 (0.09)		0.33 (0.19)		
River carpsucker	0.44 (0.18)		1.00 (0.63)			0.25 (0.11)		0.25 (0.25)		
Smallmouth buffalo	0.46 (0.18)		1.08 (0.64)			0.25 (0.09)		0.13 (0.07)		
Bigmouth buffalo	0.86 (0.42)		1.13 (0.81)			0.81 (0.53)		0.08 (0.08)		
Silver redhorse	0.02 (0.02)					0.03 (0.03)				
Golden redhorse	0.07 (0.04)		0.21 (0.13)			0.03 (0.03)				
Shorthead redhorse	0.09 (0.03)		0.25 (0.11)			0.03 (0.03)		0.04 (0.04)		
Yellow bullhead								0.04 (0.04)		
Channel catfish	0.12 (0.07)					0.17 (0.09)		0.08 (0.06)		
Grass pickerel								0.04 (0.04)		
Blackstripe topminnow	0.04 (0.02)		0.08 (0.06)			0.03 (0.03)		0.08 (0.08)		
Western mosquitofish	0.39 (0.09)		0.29 (0.15)			0.31 (0.10)		2.33 (1.13)		
Brook silverside	0.30 (0.10)		0.75 (0.30)			0.11 (0.09)		0.71 (0.48)		
White bass	0.66 (0.20)		0.58 (0.42)			0.64 (0.24)		1.50 (0.77)		
Bluegill	2.12 (0.49)		4.63 (1.53)			0.89 (0.36)		6.88 (3.08)		
Largemouth bass	0.37 (0.10)		1.21 (0.37)			0.06 (0.04)		0.38 (0.12)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in the La Grange Pool of the Illinois River using stratified random sampling during 1995. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	ALL	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
White crappie	0.05 (0.02)		0.08 (0.06)					0.63 (0.32)		
Black crappie	0.18 (0.10)		0.67 (0.40)					0.13 (0.07)		
Mud darter	0.01 (0.01)							0.17 (0.13)		
Johnny darter	0.03 (0.02)		0.08 (0.06)					0.13 (0.13)		
Logperch	0.02 (0.02)					0.03 (0.03)		0.08 (0.06)		
Sauger	0.07 (0.05)		0.13 (0.13)			0.06 (0.06)		0.08 (0.08)		
Walleye	0.04 (0.03)					0.06 (0.04)				
Freshwater drum	2.44 (1.26)		0.33 (0.12)			2.78 (1.80)		9.21 (4.04)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Longnose gar									0.08 (0.08)
Shortnose gar							0.17 (0.17)		0.58 (0.19)
Goldeye									3.17 (2.02)
Skipjack herring									0.83 (0.42)
Gizzard shad							36.00 (13.34)		1134.33 (1051.74)
Threadfin shad									0.75 (0.58)
Goldfish									0.25 (0.18)
Grass carp									0.08 (0.08)
Red shiner							0.17 (0.17)		0.08 (0.08)
Common carp							36.67 (11.87)		43.25 (17.01)
Goldfish x carp							1.00 (0.45)		0.08 (0.08)
Golden shiner							1.83 (1.47)		
Emerald shiner							1.17 (0.79)		1.42 (1.02)
River carpsucker							0.17 (0.17)		0.17 (0.11)
Quillback									0.08 (0.08)
Smallmouth buffalo							3.33 (1.43)		8.08 (3.04)
Bigmouth buffalo							7.00 (2.84)		2.50 (1.27)
Black buffalo							0.33 (0.21)		0.42 (0.19)
Golden redhorse									0.25 (0.25)
Shorthead redhorse							0.83 (0.48)		2.58 (1.55)
Channel catfish							1.67 (0.56)		0.83 (0.41)
Flathead catfish							0.67 (0.49)		0.83 (0.32)
Blackstripe topminnow							0.33 (0.21)		
Brook silverside									0.33 (0.33)
White perch									0.17 (0.17)
White bass							7.17 (2.02)		51.33 (15.06)
Yellow bass									4.25 (3.31)
Striped x white bass							0.17 (0.17)		0.33 (0.19)
Rock bass							0.17 (0.17)		
Green sunfish							0.33 (0.21)		0.83 (0.34)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Pumpkinseed									0.17 (0.11)
Warmouth							0.50 (0.22)		0.08 (0.08)
Bluegill							26.50 (8.44)		19.08 (5.09)
Redear sunfish									0.08 (0.08)
Green sunfish x bluegill							0.33 (0.33)		0.33 (0.19)
Smallmouth bass									0.17 (0.11)
Largemouth bass							3.67 (1.43)		4.75 (1.65)
White crappie							8.33 (2.01)		20.33 (7.74)
Black crappie							5.67 (2.94)		6.92 (2.33)
Johnny darter									0.08 (0.08)
Logperch							0.17 (0.17)		0.17 (0.17)
Sauger									1.00 (0.44)
Freshwater drum							4.83 (1.01)		3.25 (1.01)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Paddlefish									0.09 (0.09)
Shortnose gar							0.17 (0.17)		1.91 (0.64)
Goldeye									0.73 (0.33)
Gizzard shad							19.96 (10.17)		455.36 (359.29)
Goldfish									0.18 (0.18)
Red shiner							0.17 (0.17)		0.36 (0.28)
Common carp							38.29 (8.16)		45.45 (11.40)
Goldfish x carp							0.33 (0.21)		0.64 (0.36)
Golden shiner							0.67 (0.49)		0.45 (0.28)
Emerald shiner							1.79 (0.73)		2.36 (1.79)
Silverband shiner									0.09 (0.09)
Bullhead minnow									0.09 (0.09)
River carpsucker									1.45 (0.73)
Smallmouth buffalo							12.46 (3.52)		14.91 (5.26)
Bigmouth buffalo							6.75 (1.96)		4.09 (1.40)
Black buffalo							1.17 (0.65)		0.73 (0.24)
Shorthead redhorse							1.17 (0.98)		1.27 (0.49)
Channel catfish							0.17 (0.17)		0.55 (0.37)
Flathead catfish							0.50 (0.34)		0.91 (0.37)
Brook silverside									0.09 (0.09)
White perch									0.09 (0.09)
White bass							3.25 (2.06)		62.36 (12.05)
Yellow bass									1.73 (0.56)
Striped x white bass									0.55 (0.21)
Rock bass									0.09 (0.09)
Green sunfish							0.17 (0.17)		0.27 (0.19)
Pumpkinseed									0.18 (0.12)
Warmouth							0.33 (0.21)		
Orangespotted sunfish									0.09 (0.09)
Bluegill							22.38 (7.57)		10.36 (2.67)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Green sunfish x bluegill									0.09 (0.09)
Smallmouth bass									0.55 (0.25)
Largemouth bass							3.67 (1.43)		2.73 (0.85)
White crappie							5.08 (1.28)		8.55 (2.05)
Black crappie							3.33 (1.05)		7.09 (3.44)
Logperch									0.18 (0.18)
Sauger							0.17 (0.17)		3.00 (2.03)
Walleye									0.18 (0.12)
Freshwater drum							13.29 (2.87)		7.18 (2.03)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar									2.85 (1.97)
Goldeye									0.17 (0.11)
Skipjack herring									0.09 (0.09)
Gizzard shad									16.30 (5.08)
Threadfin shad									0.24 (0.24)
Goldfish									0.09 (0.09)
Common carp									7.13 (3.19)
Golden shiner									0.17 (0.11)
River carpsucker									1.02 (0.70)
Quillback									0.08 (0.08)
Smallmouth buffalo									5.73 (3.75)
Golden redhorse									0.08 (0.08)
Shorthead redhorse									5.81 (2.16)
Black bullhead									0.17 (0.11)
Brown bullhead									0.25 (0.13)
Channel catfish									1.59 (0.78)
Flathead catfish									0.51 (0.27)
Northern pike									0.08 (0.08)
White bass									45.37 (26.52)
Yellow bass									0.51 (0.23)
Striped bass									0.09 (0.09)
Striped x white bass									0.26 (0.26)
Green sunfish									0.08 (0.08)
Pumpkinseed									0.08 (0.08)
Orangespotted sunfish									0.08 (0.08)
Bluegill									14.41 (7.16)
Largemouth bass									0.25 (0.13)
White crappie									18.35 (11.63)
Black crappie									33.76 (12.99)
Sauger									0.66 (0.28)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Walleye									0.09 (0.09)
Freshwater drum									15.04 (6.41)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Spotted gar							0.34 (0.34)		
Shortnose gar							1.01 (1.01)		0.08 (0.08)
Skipjack herring							0.17 (0.17)		
Gizzard shad							25.19 (15.95)		12.45 (7.98)
Threadfin shad							0.87 (0.87)		
Red shiner							1.19 (0.49)		0.09 (0.09)
Common carp							1.22 (0.57)		0.25 (0.18)
Golden shiner							5.38 (3.82)		0.25 (0.18)
Emerald shiner							5.00 (2.08)		1.54 (1.12)
Spottail shiner									0.17 (0.11)
Silverband shiner									0.08 (0.08)
Smallmouth buffalo							0.17 (0.17)		
Bigmouth buffalo									0.08 (0.08)
Black buffalo							0.17 (0.17)		
Shorthead redhorse							0.17 (0.17)		0.08 (0.08)
Black bullhead							0.17 (0.17)		1.98 (1.73)
Yellow bullhead							0.34 (0.34)		0.91 (0.91)
Channel catfish							2.44 (1.29)		1.37 (0.95)
Flathead catfish									0.17 (0.17)
Western mosquitofish							1.03 (0.37)		
Brook silverside							0.17 (0.17)		
White bass							2.60 (2.40)		8.29 (4.64)
Yellow bass									0.09 (0.09)
Green sunfish							0.51 (0.23)		0.34 (0.19)
Orangespotted sunfish							0.68 (0.34)		0.09 (0.09)
Bluegill							2.91 (1.12)		4.07 (2.00)
Largemouth bass							0.17 (0.17)		
White crappie							1.72 (0.83)		1.36 (1.02)
Black crappie							0.52 (0.35)		3.57 (2.74)
Mud darter									0.25 (0.25)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 2

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Johnny darter									0.09 (0.09)
Logperch							0.52 (0.35)		0.26 (0.19)
Sauger									1.19 (1.19)
Freshwater drum							9.01 (5.87)		28.88 (23.48)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Gizzard shad									0.04 (0.04)
Common carp							4.74 (1.93)		7.03 (2.02)
Goldfish x carp									0.04 (0.04)
River carpsucker									0.04 (0.04)
Smallmouth buffalo									0.21 (0.13)
Shorthead redhorse									0.04 (0.04)
Channel catfish							0.40 (0.25)		10.31 (6.06)
Flathead catfish							0.20 (0.12)		0.08 (0.06)
White bass									0.42 (0.25)
White crappie									0.08 (0.08)
Freshwater drum							0.10 (0.10)		0.33 (0.14)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Goldeye									0.08 (0.08)
Skipjack herring									0.04 (0.04)
Gizzard shad									0.76 (0.36)
Common carp							2.41 (0.94)		8.10 (3.00)
River carpsucker									0.75 (0.71)
Smallmouth buffalo							0.92 (0.67)		11.71 (5.49)
Bigmouth buffalo									0.13 (0.13)
Black buffalo							0.17 (0.17)		0.34 (0.22)
Shorthead redhorse									0.04 (0.04)
Brown bullhead							0.08 (0.08)		
Channel catfish									0.49 (0.24)
Flathead catfish									0.04 (0.04)
White bass									1.34 (0.85)
Striped x white bass									0.04 (0.04)
White crappie									0.34 (0.20)
Black crappie									0.04 (0.04)
Sauger									0.04 (0.04)
Freshwater drum							1.35 (0.45)		0.99 (0.46)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Shortnose gar							0.17 (0.11)		
Gizzard shad							49.67 (19.58)		
Threadfin shad							2.42 (1.49)		
Red shiner							0.42 (0.29)		
Common carp							0.08 (0.08)		
Silver chub							0.08 (0.08)		
Golden shiner							1.83 (1.26)		
Emerald shiner							10.83 (3.50)		
Smallmouth buffalo							0.42 (0.19)		
Bigmouth buffalo							0.08 (0.08)		
Black buffalo							0.17 (0.11)		
Shorthead redhorse							0.17 (0.17)		
Blackstripe topminnow							0.17 (0.11)		
Western mosquitofish							0.83 (0.44)		
Brook silverside							0.50 (0.19)		
White bass							1.92 (1.10)		
Bluegill							1.50 (0.65)		
Largemouth bass							0.42 (0.15)		
White crappie							0.17 (0.11)		
Freshwater drum							2.42 (1.06)		

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

Table 6.4.8. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in the La Grange Pool of the Illinois River using fixed-site sampling during 1995. See text for definitions of catch-per-unit-effort and standard error.

Table page: 1

Common name	BWCO	BWCS	IMPO	IMPS	MCBU	MCBW	SCB	TRI	TWZ
Gizzard shad									1.92 (1.47)
Common carp									0.79 (0.34)
Silver chub									0.04 (0.04)
Bigmouth buffalo									0.04 (0.04)
Golden redhorse									0.04 (0.04)
Shorthead redhorse									0.25 (0.11)
Channel catfish									1.83 (0.61)
Flathead catfish									0.08 (0.06)
White bass									0.21 (0.08)
White crappie									0.04 (0.04)
Sauger									0.21 (0.15)
Freshwater drum									2.63 (0.71)

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
 BWCO - Backwater, contiguous, offshore. SCB - Side channel border.
 IMPS - Impounded, shoreline. TRI - Tributary mouth.
 IMPO - Impounded, offshore. TWZ - Tailwater.
 MCBU - Main channel border, unstructured.

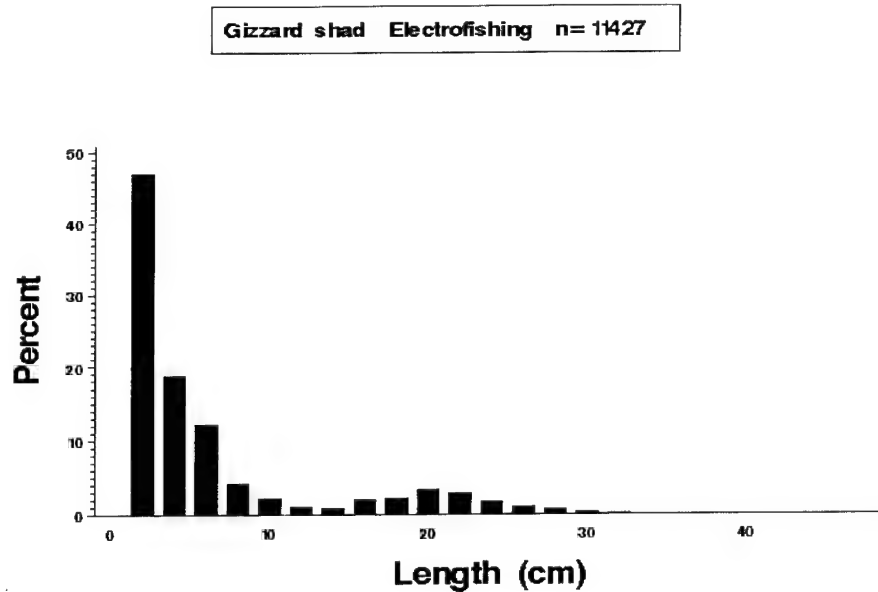


Figure 6.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

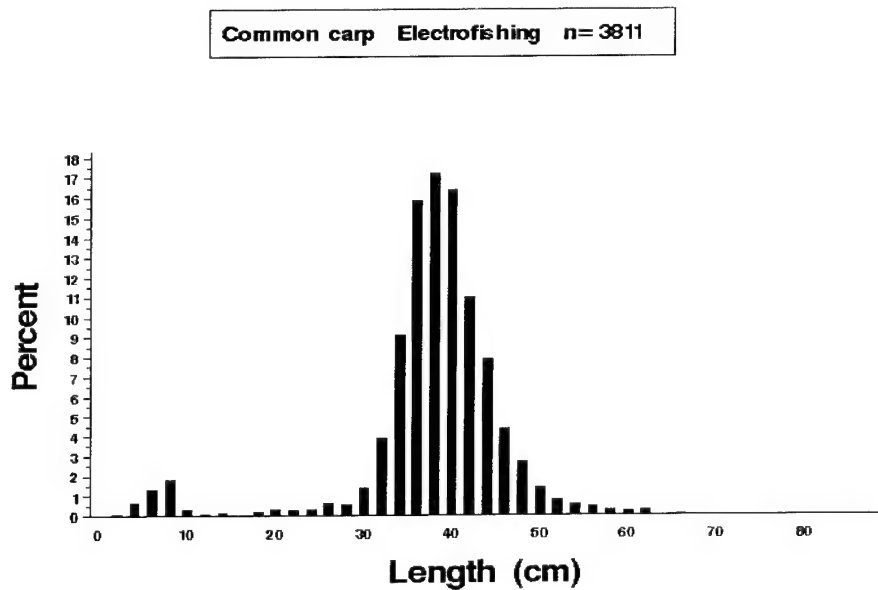


Figure 6.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

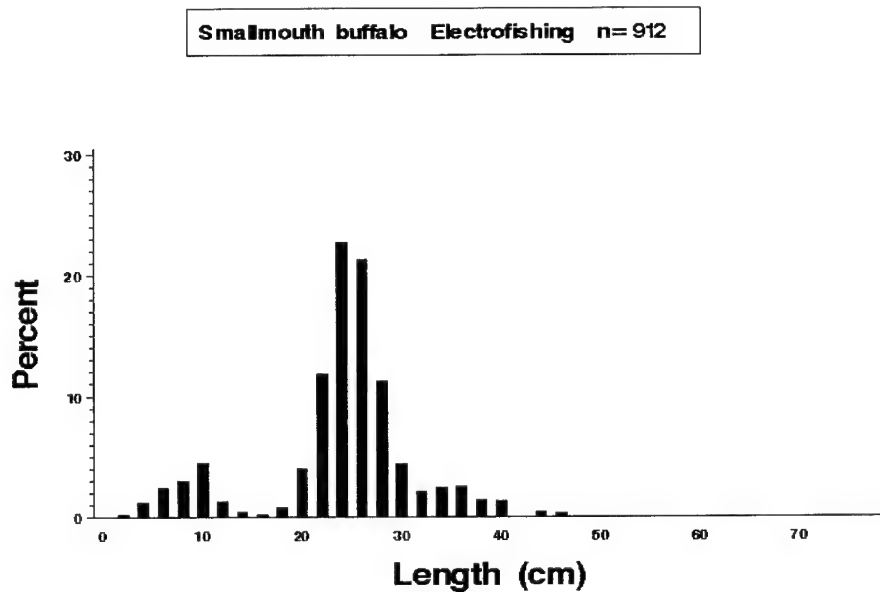


Figure 6.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

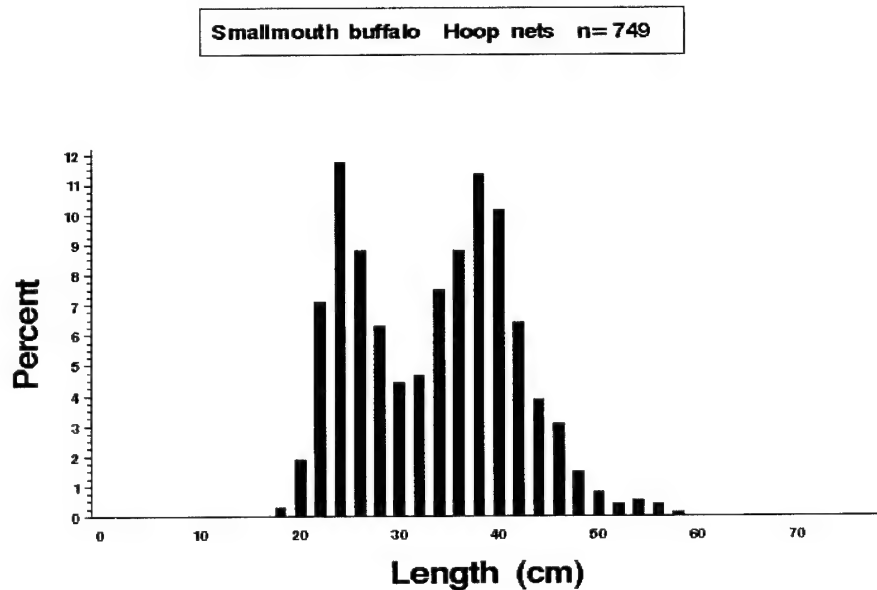


Figure 6.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by large and small hoop netting in the Illinois River, La Grange Pool during 1995.

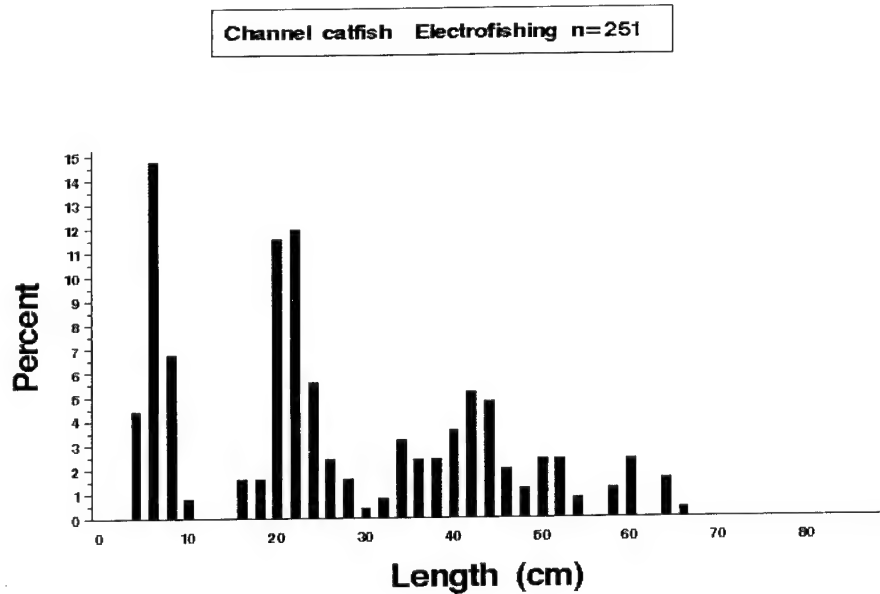


Figure 6.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

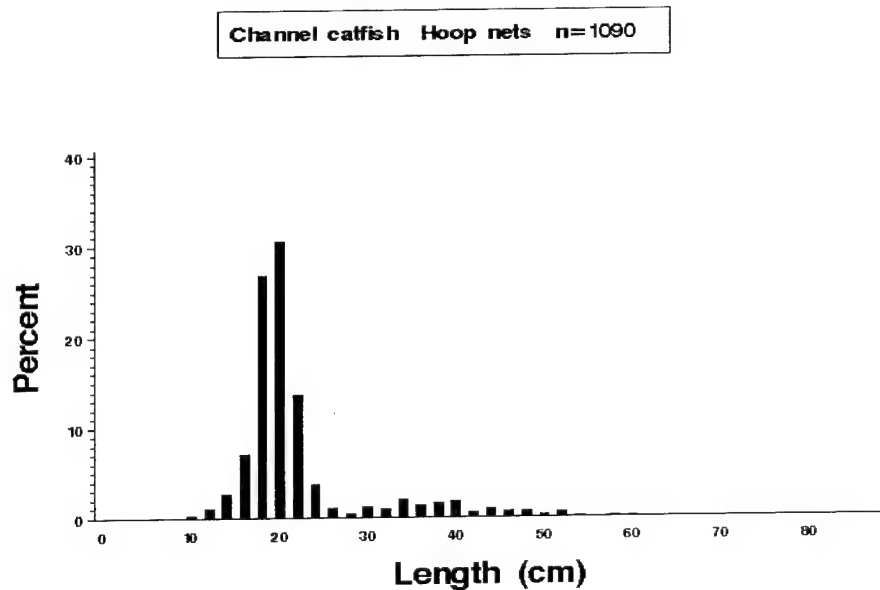


Figure 6.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by large and small hoop netting in the Illinois River, La Grange Pool during 1995.

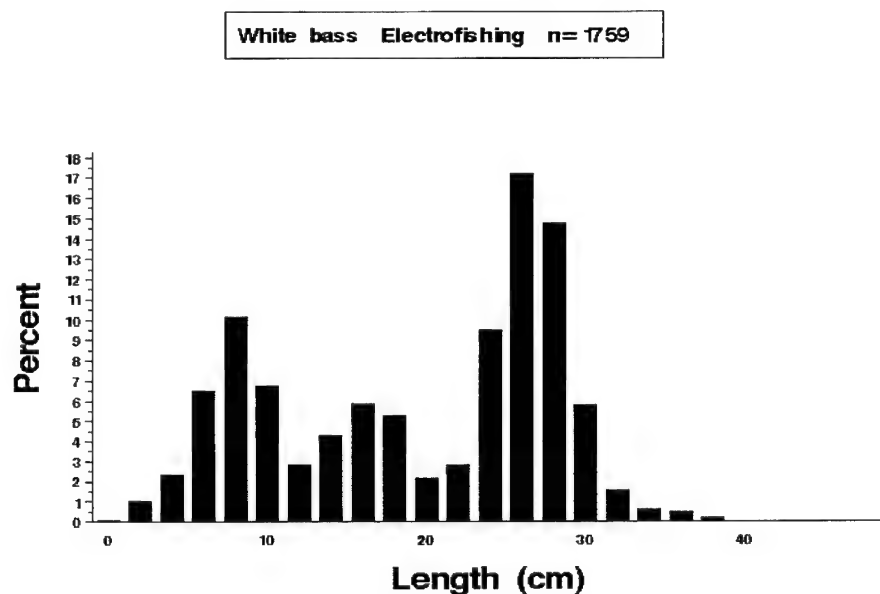


Figure 6.8. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

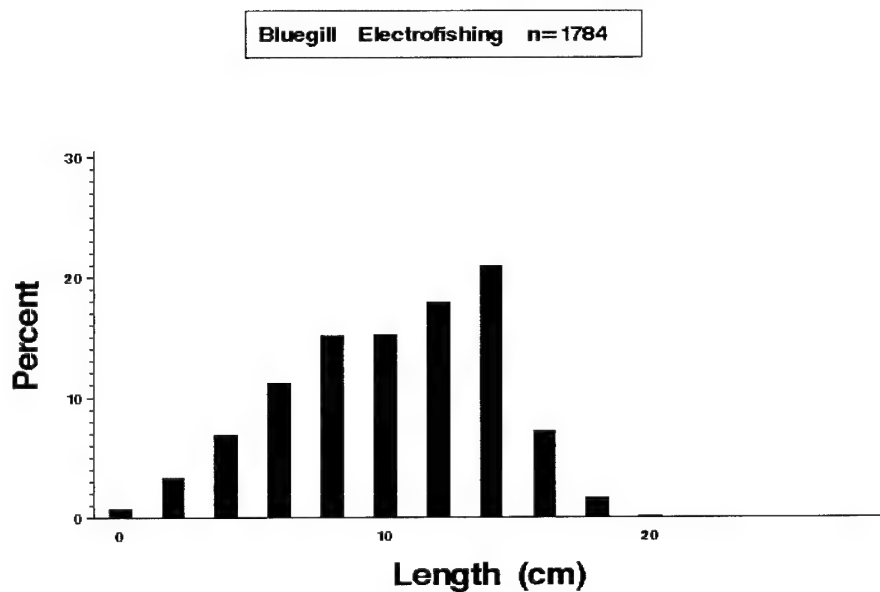


Figure 6.9. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

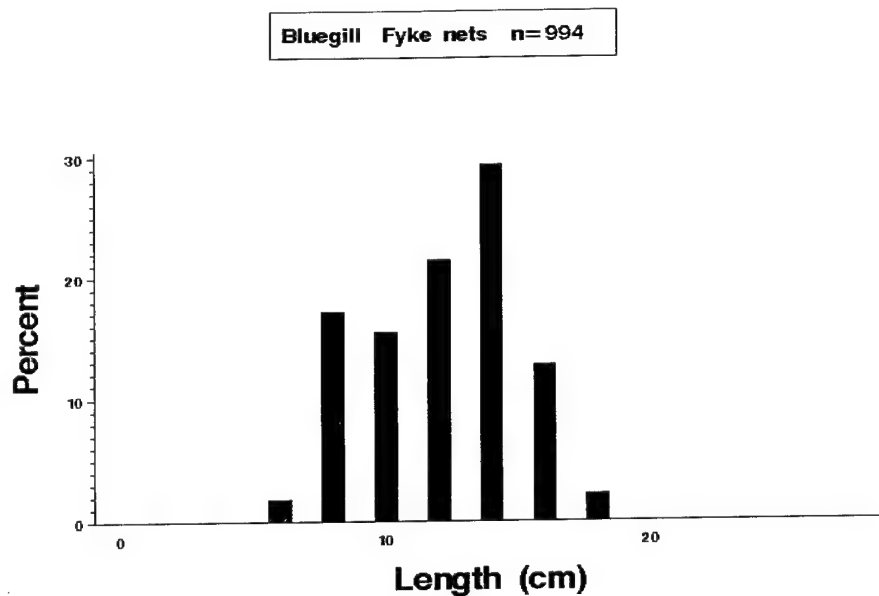


Figure 6.10. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in the Illinois River, La Grange Pool during 1995.

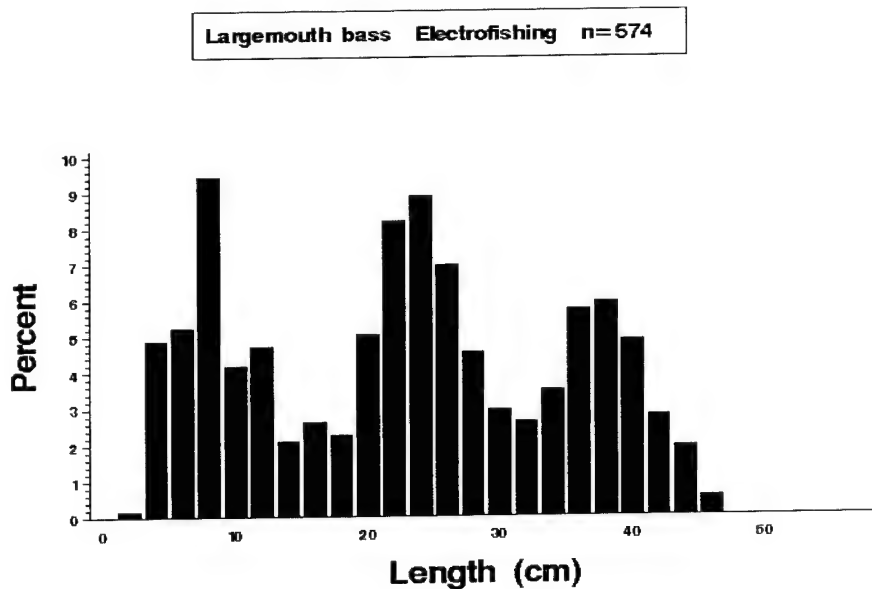


Figure 6.11. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

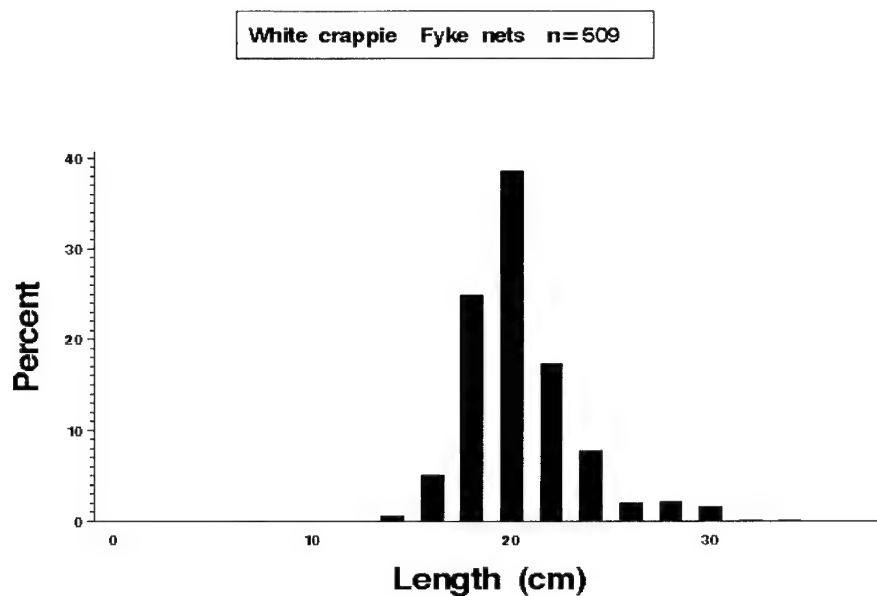


Figure 6.12. Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularis*) collected by fyke netting in the Illinois River, La Grange Pool during 1995.

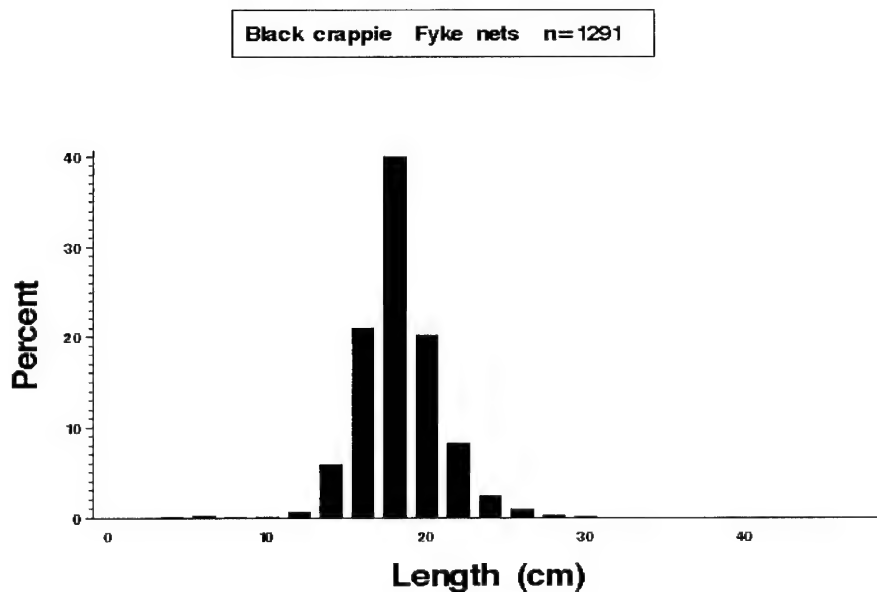


Figure 6.13. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in the Illinois River, La Grange Pool during 1995.

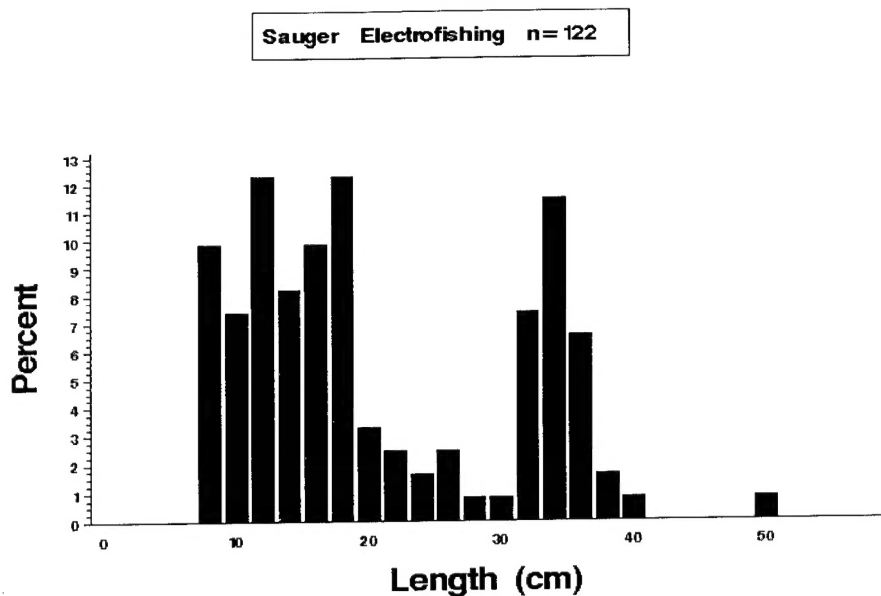


Figure 6.14. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

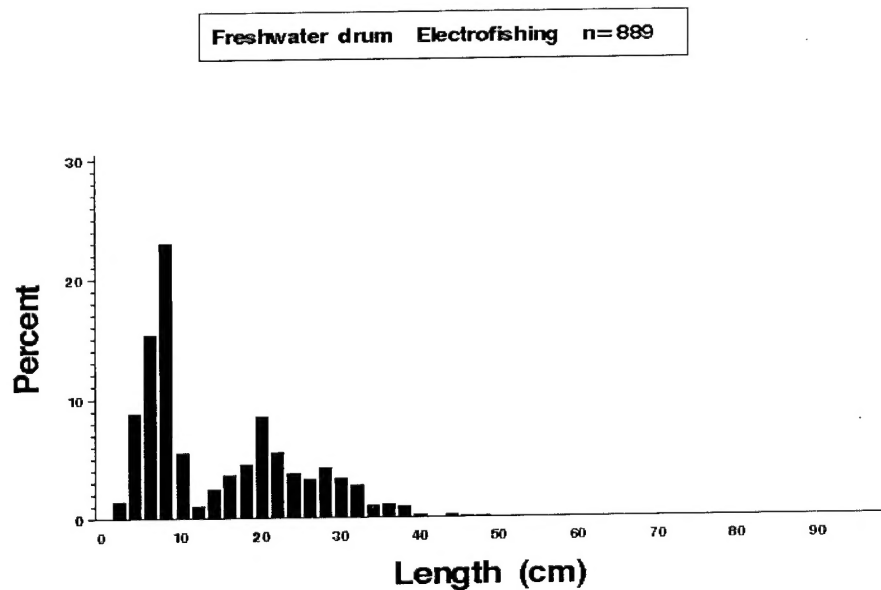


Figure 6.15. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in the Illinois River, La Grange Pool during 1995.

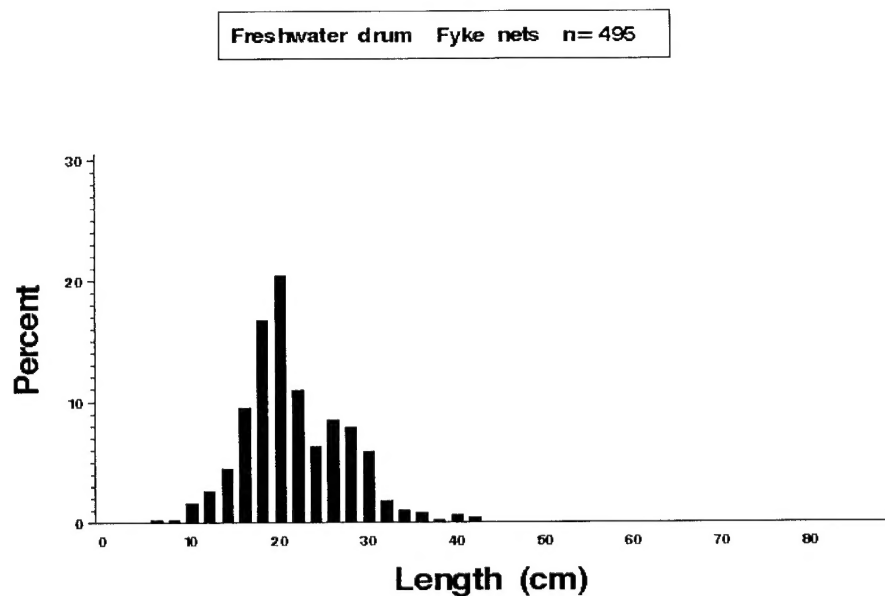


Figure 6.16. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in the Illinois River, La Grange Pool during 1995.

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13. ABSTRACT (Maximum 200 words) The Long Term Resource Monitoring Program (LTRMP) completed 2,723 collections of fishes from stratified random and permanently fixed sampling locations in six study reaches of the Upper Mississippi River System during 1995. Collection methods included day and night electrofishing, hoop netting, fyke netting (two net sizes), gill netting, seining, and trawling in select aquatic area classes. The six LTRMP study reaches are Pools 4 (excluding Lake Pepin), 8, 13, and 26 of the Upper Mississippi River, an unimpounded reach of the Mississippi River near Cape Girardeau, Missouri, and the La Grange Pool of the Illinois River. A total of 59-72 fish species were detected in each study reach. For each of the six LTRMP study reaches, this report contains summaries of: (1) sampling efforts in each combination of gear type and aquatic area class, (2) total catches of each species from each gear type, (3) mean catch-per-unit of gear effort statistics and standard errors for common species from each combination of aquatic area class and selected gear type, and (4) length distributions of common species from selected gear types.			
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The Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System was authorized under the Water Resources Development Act of 1986 as an element of the Environmental Management Program. The mission of the LTRMP is to provide river managers with information for maintaining the Upper Mississippi River System as a sustainable large river ecosystem given its multiple-use character. The LTRMP is a cooperative effort by the U.S. Geological Survey, the U.S. Army Corps of Engineers, and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin.

